PULP & PAPER

OCTOBER 1960

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page 77

Improved Pulp Chlorination
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More on Outside Chip Storage
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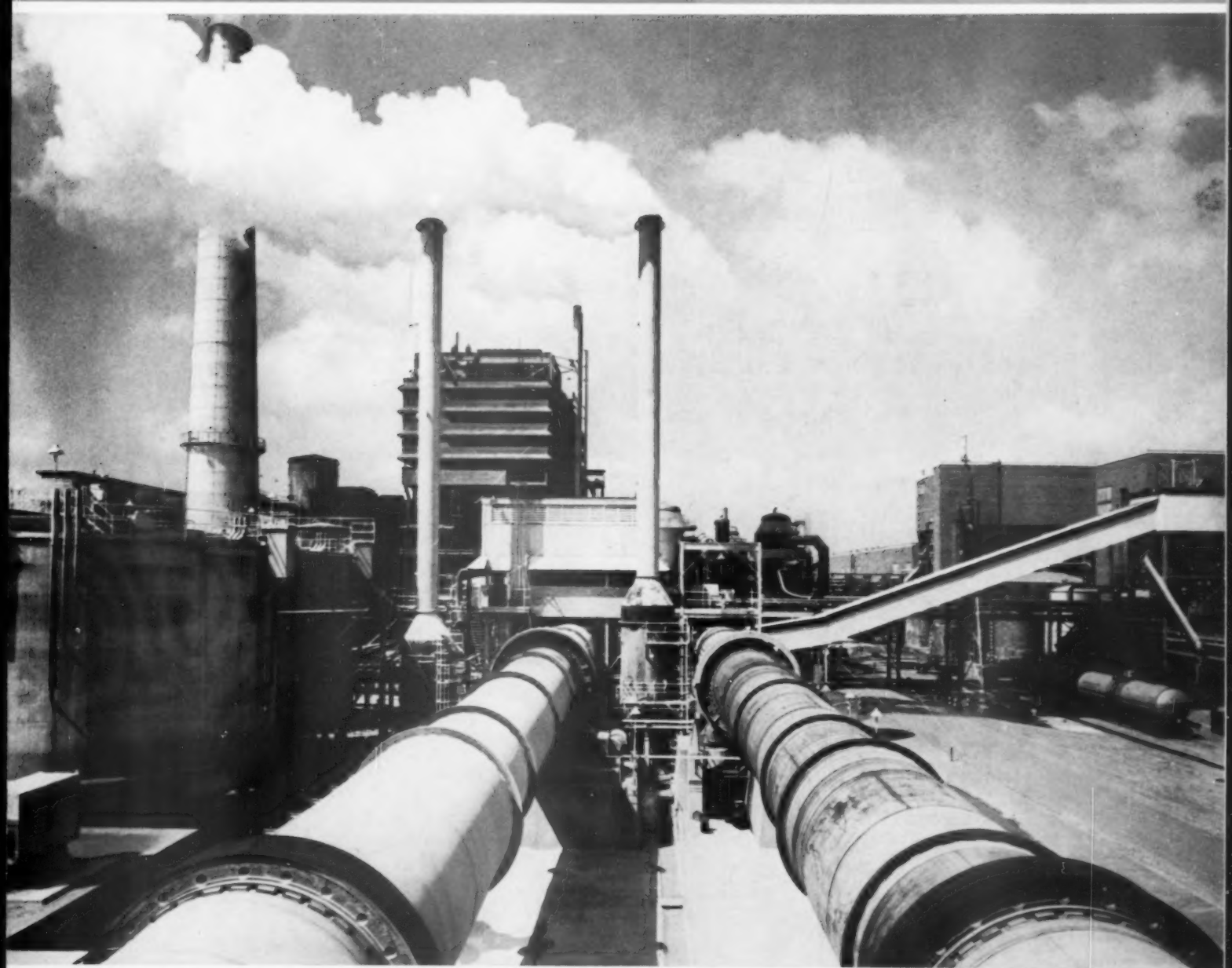


SPECIAL REPORT ON DIGESTER CORROSION . . .

Buckeye at Foley has virtually solved kraft corrosion in 14 digesters See page 84

Introducing

THE

RAFFINATOR

DISC REFINER

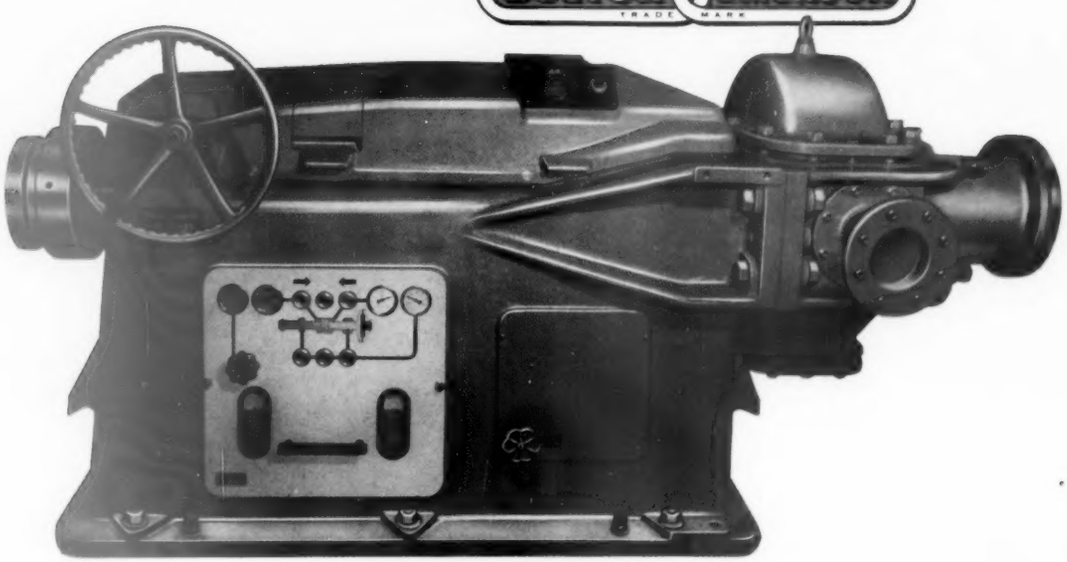
Push Button Precision and rugged construction identify the Raffinator Disc Refiner. The Raffinator is exclusive among disc refiners in having a hydraulic system for accurate, finger-tip control over disc positions at all times. Visual indicator shows plate settings magnified 80 times. Operates also on floating principle to allow for varying stock pressures.

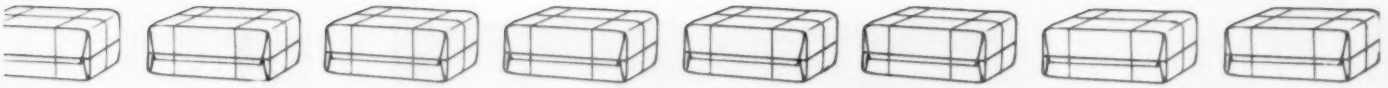
Raffinator Disc Refiners are superbly engineered precision machines for all types of defibrating, and pump through or pressure refining at up to 20% consistency. Operates at speeds of 700-1000 rpm. All parts in contact with pulp stock are stainless steel. Refining discs are available in 24″, 36″, or 50″ diameters — in a variety of types and materials. Extra large shaft diameter prevents deflection in disc settings. Split shell facilitates precision plate adjustment and removal.

The Raffinator is delivered complete with electrical control panel. Even with its many unusual performance features, it is priced competitively with conventional disc refiners. Before selecting a disc refiner, it is wise to investigate the extraordinary advantages found in the Raffinator — already proved in over 600 mill installations.

Raffinator Disc Refiners, product of Swedish design and engineering, are now available in North America through Bolton-Emerson. For full information, contact *The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusetts.*

BOLTON EMERSON
TRADE MARK





Produce Pulp at less cost per ton with Rice Barton's Fibre-Flash Pulp Dryer

Within 100 mi. of Oslo this pulp mill is producing 100 T.P.D. at impressively low costs.

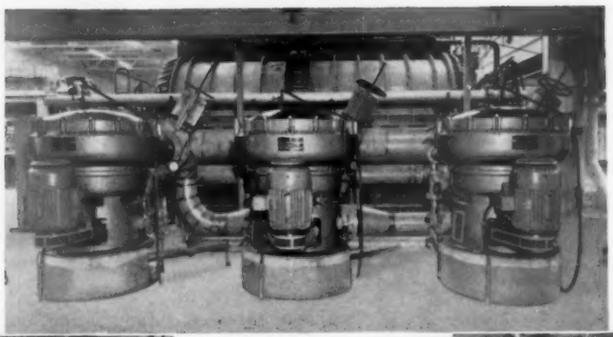
From stock chest to baler the **FIBRE-FLASH** system is mechanically far simpler, has a minimum of moving parts and costs less to operate and to maintain than conventional pulp dryers. It conserves every physical characteristic of pulp and is currently being used successfully for both groundwood and chemical pulps.

With our *Pilot Plant* you can see the advantages of drying your pulp the **FIBRE-FLASH** way. The lower capital investment, the lower installation cost and the smaller amount of space required also make flash-drying the most economical, modern method of drying pulp. Write today for complete details.

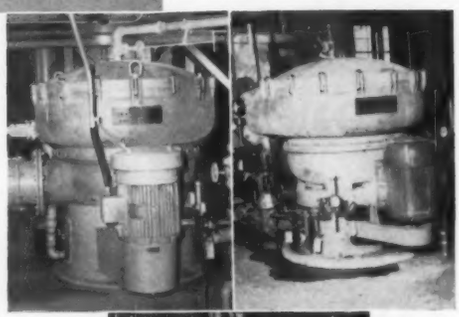
PHOTO COURTESY KAMMEFORS BRUK, KRAGERÖ, NORWAY

Rice Barton CORPORATION • WORCESTER, MASS.

FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS AND SUPERCALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS



EVERY-WHERE YOU LOOK YOU'LL BE SEEING



BIRD CENTRISCREENS

— and their users will tell you that these compact, sturdy pressure screening units:

- work and keep on working right from the first push of the button, without screen plate breaks, erosion or operating hitches of any kind
- reduce breaks on the machine
- cut down on down time
- increase wire life
- improve sheet formation
- eliminate lumps and slime
- permit faster machine speeds
- produce uniform results on difficult grades — all at minimum screening cost per ton

Centriscreening and its operating advantages and savings applies to *your* stock and *your* volume requirements, especially now that there are *three sizes* of Centriscreens: Model 6 for up to 1200 gpm, Model 10 for up to 3000 gpm, Model 14 for up to 6000 gpm.

Let us submit recommendations, layouts, estimates.

BIRD MACHINE COMPANY

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Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

PULP & PAPER

Reader's Guided Tour

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77 Europe's Booming Economy

A remarkable upswing in Europe's economy is taking place, and with it swings the pulp and paper industry. Editor Albert W. Wilson reports from inside Europe, assesses factors behind this growth, the changing trade picture—and tells who buys market pulp in Europe.

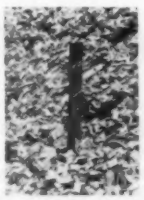
84 Buckeye Solves Digester Corrosion

With kraft digester corrosion reportedly rising, Buckeye Cellulose Corp. says it has no corrosion in its 14 kraft digesters at Foley, Fla. This exclusive report tells why, and describes the background research studies.

94 High Pressure Power Plants

International Paper Co's power plant expert, Jack Judge, explains the industry's new interest in high pressure power generation, cites its advantages and disadvantages and lays down some ground rules for safe and efficient operation.

111 Outside Chip Storage Reappraised



There is still some skepticism that outside chip storage is feasible in the South. But St. Regis, in cooperation with the U.S. Forest Service, has prepared a detailed study on outside chip storage. Southern Editor Bill Diehl with his background of Southern chip controversy reports on this study.

CIRCULATION DEPT., 500 Howard St., San Francisco 5, Calif. C. C. Banke, Circ. Mgr. Send subscription orders and changes of address to PULP & PAPER, above address. Include both old and new addresses.

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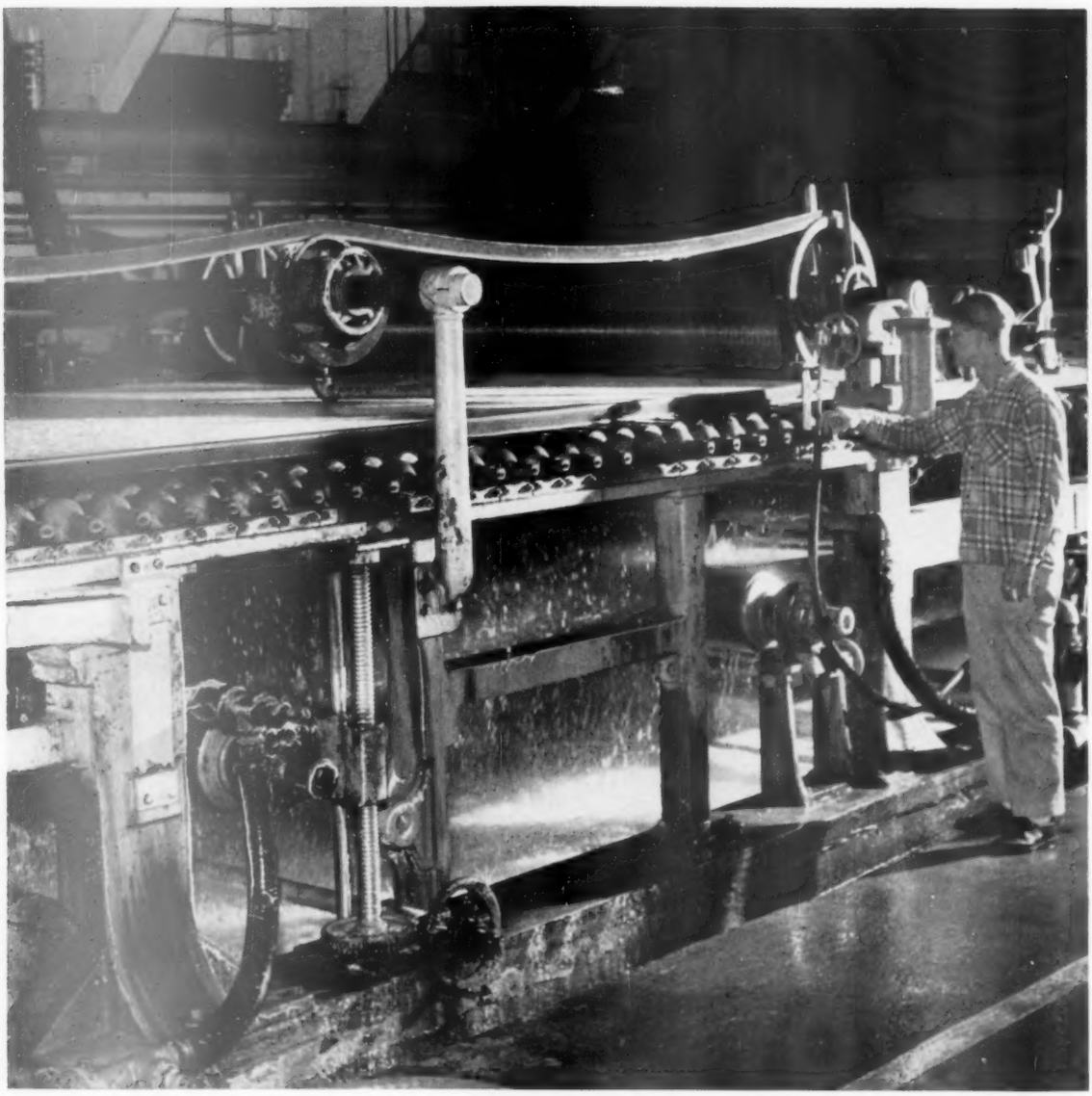

Always a downpour, never a geyser

B.F.Goodrich rolls shed water fast, throw it down and away

THE picture proves our point. With B.F.Goodrich table rolls, there's no danger of water spray returning to the wire and spotting the sheet. That's because the mirror-smooth rubber covers on BFG rolls shed water instantly. Even rolls running at 1000 feet a minute need no deflectors.

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Next time you buy a new Fourdrinier, or have one rebuilt, be sure that B.F.Goodrich Dukbak rolls are in your specifications. In the meantime, if you'd like more facts on BFG paper mill rolls, send for our free catalog. *B.F.Goodrich Industrial Products Co., Dept. M-898, Akron 18, Ohio.*

B.F.Goodrich

PAPER MILL ROLLS

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MILLER FREEMAN PUBLICATIONS

The Editor Reads His Mail

Address letters to The Editor, PULP & PAPER, 1791 Howard St., Chicago 26, Ill

Comments on Mr. Chisholm's Article on Industry Profits

—New York

The Editor: Please accept my congratulations of that excellent article by William H. Chisholm, president of the Oxford Paper Company published by you in the August issue of PULP & PAPER. It contains the kind of analysis and thinking of which there should be much more by industrial executives, labor leaders and membership—and politicians.

I liked, especially, Mr. Chisholm's comments regarding the press reports of profits. As commonly reported, without relation to percentages of net profits on sales and on investments, they give a sadly distorted picture. It is interesting to note the almost constant, year by year, decline of those ratios for the several past years as reported by most paper companies.

Mr. Chisholm's comment that: "There is no such thing as standing still in this or any other industry!" is a fact too often overlooked by some executives. Measured by (a) growth of the industry, (b) increase in the G.N.P. of the country, (c) increase of the U.S. population, (d) increase in per-capita consumption of paper and (e) inflation, or decrease in the purchasing value of the dollar, a company which can report a 10-year increase of sales equal to only that percentage shown by any one of those yardsticks is definitely NOT progressing or standing still or "holding its position" n the industry.

There is, however, one very important gain which has been made by the paper industry, and which should be encouraging to owners and managements of companies in the industry. It is the gain in public investor confidence and interest. The stock market charts comparing the 10-year stock market values of eight paper companies actively traded with the stocks of leading companies in eight other leading industries, showed that in each case the 10-year increase of the paper company composites far out-distanced the other industries.

C. LESTER HORN
Business Consultant

Portland, Maine

Editor: Mr. Chisholm (William H. Chisholm, Pres. of Oxford Paper Co.) and PULP & PAPER are to be congratulated on the excellent article by Mr. Chisholm in your August issue, entitled "Are Profits Too Low."

I have often thought how ridiculous and misleading the usual press reports of corporation profits are by simply headlining the total profits in dollars without relating them to invested capital or total sales. Likewise, I have wondered why business people have not taken issue with the press before this. They may have, but Mr. Chisholm's article was the first I have seen on this irresponsible reporting.

Less sensational, but infinitely more accurate, would be to report "G.M. Makes 6% on Sales, 5% on Invested Capital, Amounting to $700,000,000." Instead of furnishing the unions and left-wing politicians with ammunition by reporting dollar profits only, the press could perform a real public service by realistic reporting of corporation profits, which, as Mr. Chisholm points out, are becoming insufficient, let alone exorbitant.

D.A. SWAN
Forest Engineer
American Pulpwood Association

Another on Neal Award

—London, England

Editor: I add my congratulations to the many you have received, on your being presented with the Jesse H. Neal Editorial Achievement Award.

This Award is a just recognition of the excellent work you have put into your magazine in providing factual information to the paper industry while maintaining the highest standards of journalism.

CYRIL SHRUBEHALL
Group Public Relations Officer

The BEST WORLD REVIEW

Editor: The 1960 World Review of PULP & PAPER is so much better than all previous issues, or at least it seems so to me, that I cannot help but write you and tell you so. Well do I remember PULP & PAPER's very first Annual Review, which I still have at home. You have done a superb job of initiating this Review Number of the magazine and improving it over the years.

HERMAN N. SIMPSON
Consulting Engineer

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for domestic and world-wide
sales of pulp, paper,
paperboard and newsprint.

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WOOD PULP G

ESTABLISHED 1886

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MONTHLY REPORT – WORLD NEWS

ST. MARYS KRAFT CORP. TO ADD NEW MACHINE . . . at St. Marys, Ga. 236-in. Beloit Fourdrinier will produce light, medium and heavy unbleached kraft and will be designed for future output of linerboard, bleached foodboard. Owner Gilman Paper Co. will transfer from its Vermont mill some kraft specialty grades.

IRON ORE, SULFITE PULP JOIN . . . to sponsor research at Michigan College of Mining & Technology, Houghton. Goal: to use spent liquor in cutting costs of making steel from low-grade Lake Superior region ores. Liquor quantities required might approach total tonnages now unused and available from all Wisconsin, Minnesota pulp mills. Sulfite materials would pelletize ore concentrates without costly high-temperature hardening.

FINAL 1959 PRODUCTION FIGURES . . . released by U.S. Bureau of the Census show total output was 34,007,068 tons (15,024,916 paper, 15,456,492 board, 149,658 wet machine board, 3,376,002 construction paper and board). Revised 1958 total: 30,814,366 tons. 1959 state ranking puts Wisconsin in lead, Florida second, New York third.

PAPER, PAPERMAKING MATERIALS FOURTH . . . among 30 leading commodity import groups last year. Total value shipped to U.S. was $1,089,400,000. Newsprint led with value of $665,700,000, paper base stocks were second at $346,100,000. Largest supplier: Canada.

ANOTHER ALL-TIME RECORD . . . is U.S. woodpulp production, says Lawson Turcotte, president, Puget Sound Pulp & Timber Co. First-half production was up 6% at 12,815,000 tons; consumption 3% ahead. Exports in six months were more than double year ago. Imports showed no material change.

U.S. INTEREST IN B.C.? . . . Reports are that U.S. interests may want to establish pulp mill along Fraser river between Hope and Chilliwack, B.C. Plant would use residue from sawmills and other wood-using plants.

DIFFICULTIES IN ARRANGING FINANCING . . . given as reason for Union Bag-Camp Paper Corp.'s decision to drop plan to purchase for some $156,000,000 outstanding common shares of Crossett Co. Says spokesman for Arkansas firm: "Entire subject of sale (to any interests) is now also closed."

OVER HALF NATION'S PACKAGING DOLLAR . . . spent for paper materials, says R. Carl Chandler, board chairman, Standard Packaging Corp. 1958 figures: $10,303,442,000 spent for packaging materials and machinery; $5,400,000,000 for component paper materials.

MORE EMPHASIS IN RESEARCH . . . is approved by Crown Zellerbach Corp.'s board of directors. Says President Reed O. Hunt: "Research is yielding increasing results in chemical production, packaging development and in other fields. By centralizing direction of research and development under a top executive, we will be in a better position to accelerate the program." (Dr. W. Monte Hearon was recently named to a new CZ position—vice pres. for research and development.)

INTEGRATED OPERATION PROJECTED FOR ALBERTA . . . where Canadian Forest Products Ltd. is considering plant near Grande Prairie, 300 miles northwest of Edmonton. If program goes through, firm would build sawmill, plywood and board plants during next few years, and a pulp mill would follow depending on economic conditions. Primary goal: fullest utilization of available timber. . . . A certainty in Canadian Forest Products' future: expansion of Port Mellon, B.C. kraft mill.

INITIAL ENTRY INTO PAPERMAKING . . . set for Brunswick Pulp & Paper Co. in $35,000,000 project at Brunswick, Ga. Program subject to approval of both owners—Mead Corp. and Scott Paper Co.

PRICE REDUCTIONS IN CHEMICAL PULP . . . result from 16% drop in rayon output for first six months. Deepest reductions said to be in viscose grades, down roughly $10 since January 1.

. . . Fluid Power news

REPORT NO. 12,105 NEW SECTION AND DRIVE IMPROVES PRODUCT

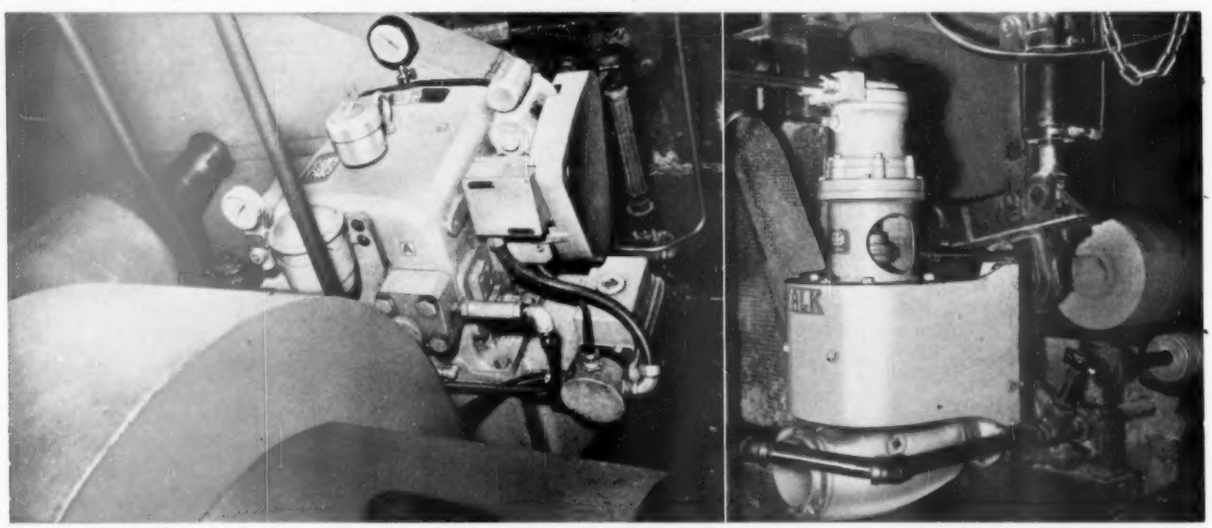
From Oilgear Application-Engineering Files

HOW OILGEAR HELPED SOLVE DRIVE PROBLEM FOR A NEW PAPER MACHINE SECTION

CUSTOMER: *A Large Midwestern Paper Manufacturer.*

DATA: To improve the finished surface of certain types and grades of paper, this manufacturer decided to insert a new sizing and smoothing section between existing sections of one of their paper machines. *Requirements: 1.* New section drive rpm must remain in same preset speed ratio with first dryer section roll regardless of over-all machine speed; allow precise, minutely controlled variation to increase or decrease wet sheet tension; hold constant speed within 6% regardless of increase or decrease of section roll pressures. *2.* Section drive to be inoperative at will without use of clutches . . . machine to operate with, or without the new section for dual purpose processing. *3.* Drive must be smooth, positive . . . without lag, shocks, or surges. *4.* Drive must fit within extremely limited, available space, and be direct-connected to new section sizing roll. *5.* Complete, individual control from a convenient, remote, push button station. *6.* Dependability, with a minimum of installation, or maintenance "downtime."

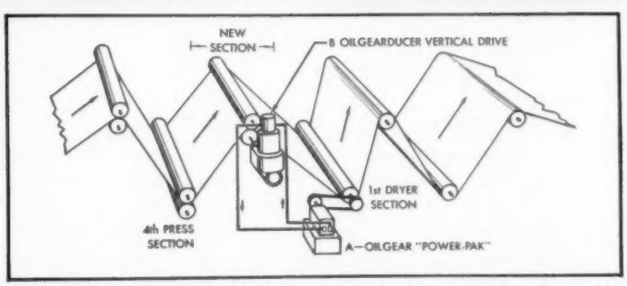
Note: A mechanical drive was considered, but space and control requirements would involve costly, major rebuilding of the entire machine.



SOLUTION: Oilgear *Application-Engineers*, working in cooperation with company engineers, analyzed the speed, torque, control, and space limitations of this installation; and recommended an Oilgear "*Any-Speed*" drive consisting of a separate, heavy-duty, Oilgear pump and motor for the following reasons. *1.* An Oilgear Type "DE," Variable Displacement Pump with Electric Remote Control and Reservoir fitted into the very limited space available, and could easily be driven from the first dryer roll. *2.* A standard *Oilgearducer*—an Oilgear Constant Displacement Fluid Power Motor with integral right-angle gear reducer—could be direct-connected to the new section sizing roll. *3.* A simple pushbutton station for controlling this new section could be conveniently mounted on the opposite side of the paper machine. *Actual operation has proved that all initial requirements were either met or exceeded.*

Being a positive displacement drive, the direct-connected sizing roll rpm remains in the same speed ratio with the first dryer roll regardless of over-all machine speed. Original constant speed requirement—within 6%—is exceeded in actual operation . . . speed remains stable within 0.5% max. variation under full min. to max. load change. Two remote control station pushbuttons command the electric pilot control motor to increase or decrease pump displacement, changing the hydraulic motor speed and the section to machine ratio . . . precisely varying tension on the wet sheet. Section can be independently started and stopped from this station while the paper machine is running. Exact drive load and temperature are indicated. *In over four years of continuous, high-speed service, there has been no reported maintenance on this drive.*

This paper manufacturer has also Oilgear-equipped a laminator winder drive; the center winder on a super-calender stack; the unwind and rewind drives on another super-calender; five "wet-end" drives of another paper machine;



Oilgear Variable Displacement Pump (A) is driven from the first dryer section to keep the new sizing and smoothing press section speed in direct relation to the dryer section speed. Actual installation is shown in photo above, left. The small, geared-head pump control motor which changes pump stroke can be seen to the right of the pump. Controlled Fluid Power from the pump drives vertically mounted Oilgearducer (B), direct-connected to the sizing roll of the new section . . . as shown in photo above.

plus other applications in the mill and powerhouse. This user, like many others in all phases of all industry, knows that *for the lowest cost per year—it's Oilgear!* Additional drive application data is available—Bulletins 10600, 10051-G, and "News" 3, 5, 8—on request, without obligation.

For similar practical solutions to YOUR rotary or linear drive and control problems, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

THE OILGEAR COMPANY

Application-Engineered Controlled Motion Systems

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MONTHLY REPORT – WORLD NEWS

CONTRACTS AWARDED . . . for principal production equipment for Menasha Wooden Ware Corp.'s planned 125-ton pulp and paper mill at North Bend, Ore. Three Black-Clawson Co. divisions involved. Pandia continuous digester system will pulp coniferous chips from sawmill and plywood plant and chips from alder pulpwood. Product: corrugating medium. Operation date set for June.

MEAD CORP. CONTINUES STREAM POLLUTION RESEARCH . . . project at School of Public Health, Univ. of North Carolina. Goal: efficient treatment of liquid waste from semi-chemical pulping at Sylva, N.C.

FINANCING PLANS FOR CELGAR LTD'S . . . 500-ton bleached kraft mill at Castlegar, B.C., reported by Celanese Corp. of America. Firm has placed $30,000,000 in 6-1/8% 20-year first mortgage bonds with Prudential Insurance Co. of America. Completion set for year's end.

EXPANSION IN NON-PAPER LINES . . . announced by Scott Paper Co., investing more than $3,000,000 for increased output of plastic drinking cups, Scottfoam —synthetic material used principally as laminate on fabrics and as air filter. Location: Eddystone, Pa.

186-IN. WINDER AT NEKOOSA, WIS. . . . where Nekoosa-Edwards Paper Co. was to install Appleton Machine Co. unit late in August on new No. 2 machine. Operating at speeds of up to 5,000 fpm, winder is equipped with two Louis Allis Co. 100-hp motors, a 100-hp drag generator for constant tension.

NEW WORLD RECORD IN MILL PRODUCTION . . . set by Savannah, Ga. plant of Union Bag-Camp Paper Corp. for average daily output in June. Paper mill average: 2,350 tons daily (previous record was 2,325). Pulp mill average: 2,487.

CONTRACTS SIGNED . . . between Gilman Paper Co. and John W. Rouse Construction Co., Gouverneur, N.Y., for: (1) installation of new stock preparation equipment and (2) rebuild of 174-in. paper machine at Gilman, Vt.

U.S. JUSTICE DEPT. CHALLENGES . . . West Virginia Pulp and Paper Co.'s acquisition this spring of controlling interest in U.S. Envelope Co. Government's charge: that action enhanced competitive position of both firms, and that potential competition might be eliminated. Says Robert Bicks, head of the department's Anti-trust div.: suit "springs directly" from study of concentration in paper industry.

5% SALES GAIN . . . expected to be maintained this fiscal year by Kimberly-Clark Corp., says Chairman John R. Kimberly. Sales in quarter ended July 31 increased to $95,695,523. Net earnings for period were up 14.8% to $6,746,858.

FOR FIRST TIME IN HISTORY . . . gypsum board will be produced chemically instead of from gypsum rock. At new Claymont, Del. plant of Allied Chemical's Barrett div. Annual capacity: sufficient board to build 32,000 homes. Expected completion date: September 1961.

NEWSPRINT FOURTH IN PUBLISHING COSTS . . . of small dailies (less than 10,000 circulation). Ranking higher: expenses for composing room, editorial and administration.

UP TO 92.7% . . . was ratio of paper production to mill capacity in U.S. for week ending August 20. Preceding week: 91.2%. Week a year ago: 96.7%.

HOPSCOTCHING THE NORTH AMERICAN INDUSTRY . . . United Container Co. acquires Bicking Paper Mills, Downingtown, Pa. producer of all paperboard types for container industry. . . . Volney Felt Mills, a division of Lloyd A. Fry Roofing Co., orders six Shartle rag beaters from Black-Clawson Co. . . . American Seal-Kap Corp. buys for about $2,000,000 Herz Mfg. Corp., producer of paper cups, food containers, related products. . . . Boise Cascade Corp. awards first contract in Wallula, Wash. mill expansion to Hoffman Construction Co., Portland, Ore.; $100,000 agreement calls for digester capacity expansion. . . .

PHOTO SHOWS two nearly identical coating colors filtering through 100 mesh screens. Both colors contain 45% solids and 16 parts of adhesive to 100 parts of pigment—with a 2/1 casein-latex ratio. Color at right contains a conventional latex. Color shown at left was formulated with FLOTROL C. Its faster filtering gives dramatic evidence of lower viscosity. And the lower viscosity of FLOTROL C color formulations means faster screening, faster preparation, better all-around results!

FORMULATE WITH DEWEY AND ALMY'S PAPER COATING LATEX

flotrol C

(formerly Darex Latex C)

From a test you can make (see description above) comes solid proof! When you formulate with FLOTROL C you can keep solids up . . . yet keep viscosity down. And that means faster coating . . . quicker, more economical drying!

FLOTROL C is recommended in high solids formulations for high shear coaters like transfer roll and trailing blade. Or, use FLOTROL C in low solids formulations for air knife and reverse roll coaters.

Both ways, FLOTROL C gives low pattern characteristics that mean smoother, more uniform coatings — plus high gloss with less calendering.

For complete information, write to us, attention Organic Chemicals Sales, at the address below.

W. R. GRACE & CO.
DEWEY AND ALMY CHEMICAL DIVISION
Cambridge 40, Massachusetts

Check these 5 big advantages of formulating with Flotrol C:

- Higher solids content for faster coating, heavier coating weights, less heat for drying
- Lower pattern for smoother, more uniform coverage
- Cuts amount of expensive ingredients needed to achieve desired fluidity
- Permits achievement of desired viscosity with less latex
- Means faster screening and preparation of coating color

MONTHLY REPORT – WORLD NEWS

MORE HOPSCOTCHING . . . Dennison Mfg. Co. forms wholly owned subsidiary, Howard Plastics Co. Inc., to produce injection and blow molded products. . . . Riegel Paper Corp. expanding research labs at Milford, N.J. mill. . . . Weyerhaeuser Co. will build shipping container plant near Olympia, Wash. . . . Hamilton Paper Co. schedules installation of Appleton Machine Co. 3,000-fpm rewinder at Plainwell, Mich. . . .

THIS YEAR "BEST EVER" . . . is expectation of Joseph M. Mazer, chairman of American Israeli Paper Mills Ltd., Hadera, Israel. "Completion of major part of expansion program means more than doubling production capacity."

SWEDEN EXPERIMENTS . . . with use of compressed air in oxygenating lakes threatened with pollution. Method resembles that for keeping channels ice-free now in use in Canada, U.S., Greenland and Sweden.

BRITISH PRODUCTION AT HIGH LEVEL . . . 329,000-ton total for May was 16% increase over same month a year ago. Quality printing and writing papers were up 21%, as were packaging boards; food wrapping papers were up 23% and other wrappings 33%.

GREATER AUTOMATION IN U.S.S.R. . . . industry is key to increased production. Yet, production plans have been revised upwards. In 1965 paper output is to reach 4,150,000 metric tons instead of the originally-scheduled 3,530,000; paperboard 3,600,000 (3,530,000), and cellulose 6,180,000 (5,100,000). Also by 1965: 120,000 tons art paper and 175,000 tons toilet and household paper.

INVESTMENT IN ARGENTINA . . . announced by Mo och Domsjö AB, Swedish forest industry group that is to contribute Kr. 1,500,000 ($300,000) to Papelera Rio Paraná SA. Investment principally in form of machinery. Swedish company will also give technical assistance to construction of plant for viscose pulp and bleached sulfite. Project will increase Argentine plant's capacity from 6,000 to 17,400 tons annually.

NEW ZEALAND PRODUCTION UP . . . in year ended March 31. Principal increases were in paper other than newsprint (5,300 tons), paperboard (4,000) and fiberboard (1,800).

COMMON MEETING GROUND . . . for solution to current split is being sought by the Common Market and European Free Trade Association. Goal: a Europe-wide customs union with internal free trade and a common tariff.

FIRST-HALF EXPORTS UP SUBSTANTIALLY . . . in Sweden. Increase in pulp was Kr. 110,000,000, that for paper and board Kr. 108,000,000.

WHY A TREE IS ATTRACTIVE . . . to insect pests will be basis of research at Institute for Agricultural & Forest Zoology of Univ. of Helsinki, Finland, on grant from U.S. Dept. of Agriculture.

NORWAY'S LARGEST COMBINED PAPER MACHINE . . . is in operation at AS Ranheim Papirfabrik on outskirts of Trondheim. Unit, built by Thunes Mek. Verksted, Oslo, cost (including new machine room) Kr. 12,000,000 and turns out high-strength kraft at 30-ton daily rate.

1,100 BALES CHEMICAL CELLULOSE . . . bound for Belgium was in first cargo to be shipped from newest U.S. Atlantic coast port. Handled at the ultra-modern Brunswick (Ga.) State Docks, the cellulose was produced by Rayonier Inc. at Jesup. U.S. cellulose producer is among nation's foremost unsubsidized exporters.

DRAMATIC EXPANSION FOR NEWSPRINT . . . forecast for Australian industry by managing director of News Ltd. Reason: increase in leisure time and higher standards of education.

"FANTASTIC GROWTH" IN DEMAND, CONSUMPTION . . . features European paper and paperboard industry this fall. Currently, more than 100 new or rebuilt machines are either being engineered and built or are in the planning stage for Western European nations alone. (See Editor Albert W. Wilson's first-hand report in this issue.)

GOODYEAR INDUSTRIAL PRODUCTS
G.T.M.-Specified
Diversipipe for handling abrasives and corrosives
A
B
C
A Long-lived abrasion- and weather-resistant cover
B Reinforcement of steel wire helix plus wrapped plies of heavy-duty fabric
C Special rubber tube to withstand abrasion and corrosion

Pipe fails after 9 months—hose goes 6 years

They hardly expected a materials handling problem at this Ohio boxmaking plant. After all, there's nothing very abrasive-*looking* about paper slurry. But the fact remained, it was eating through heavy steel pipe in a scant 9 months or less.

Here was a problem, they felt, for the G.T.M.—Goodyear Technical Man. And it was a job, as he saw it, for Diversipipe—the rugged, flexible rubber pipe designed to stand up to the roughest sort of abrasive use.

Result: the G.T.M.'s Diversipipe has now been on the job for 6 years—more than 8 times the longest pipe-life. And it's still in fine shape.

If you're losing money down the pipe at your plant, call for the G.T.M. He can recommend from hundreds of types of hose—each designed to do a specific job better—and cheaper. Contact him through your Goodyear Distributor—or by writing:

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IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

HOSE FOR ALL INDUSTRY BY

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THE GREATEST NAME IN RUBBER

Diversipipe—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

High-Yield Pulps—Rumania

DIACONESCU, V., POPPEL, EMANUEL, NICHITUS, GH., WEISS, ERNA, CALISTRU, ELENA, FELDMAN, DOREL, MATASE, C., ASANDEI, N., ROSMARIN, GH., and SIMIONESCU, CRISTOFOR. Investigations on the production of high-yield pulps. Bul. inst. politeh. Iasi [N.S.] 4(8), no. 1-2: 213-26 (1958). [Rum.; Russ. and Ger. sum.]

Sprucewood (50.5% cellulose, 32.2% lignin, 0.32% ash) chips (25x5x3 mm.) were pulped in a laboratory autoclave by the kraft process for 15, 25, 35, 55, and 70 min. at a maximum temperature of 165 or 170°C. and using a liquor containing 18, 20, or 25% active alkali. The shorter the cooking time at maximum temperature, the higher was the pulp yield; thus, at 170° and with 20% active alkali, the yield dropped from 73.7% after 15 minutes to 53% after 70 minutes. The properties of high-yield pulps obtained at 165° with either 18 or 20% active alkali were essentially similar to those of ordinary kraft pulps, whereas high-yield pulps obtained at 170° with 20% active alkali showed lower breaking length and higher folding endurance than did regular kraft pulps obtained under comparable conditions. Based on these laboratory results, full mill-scale digestions were carried out on sprucewood (51.8% cellulose, 29.5% lignin, 7.2% pentosan, 1% ether extractive, 0.6% ash, and 13.3% moisture) using a 19:4 (vol./vol.) mixture of black liquor (containing 121 and 204 g./liter of inorganic and organic solids, respectively) and white liquor (81.5% causticity, 9.80 sulfidity) and sufficient makeup caustic and sulfur to achieve nearly 90% causticity (12% active alkali) and 24% sulfidity. Heatup time was 130 minutes, time at maximum temperature was 10 minutes and total digesting time 2 hours and 45 minutes, including 5 minutes for relief of terpene vapors and 20 minutes for blowing and discharge. This was followed by a shortened diffusor wash (6 hours instead of 13 hours) and by disk refining at 1.28% consistency. The pulps obtained in yields of 65% or better were only slightly higher in lignin and slightly lower in cellulose and *a*-cellulose (with equivalent pentosan contents) than regular kraft pulps cooked for a total length of 4 hours (1 hour, 25 minutes) at maximum temperature) and washed for 13 hours under otherwise similar conditions. Their physical properties were also comparable, except for a slightly lower breaking length (8038 *vs.* 8190 m.) and a lower number of double folds (465 *vs.* 781) after beating to 32°S.-R. in a Rith hollander at 3.3% consistency. Beating in a Jokro mill for 90 minutes to 28°S-R. at 0.48% consistency resulted in a breaking length of 7245 m. and 690 double folds. 8 ref.

Marketing Research—Australia

SAULWICK, I. D. Marketing research in the paper industry. Appita 13, no. 3: xix-xxxii (Nov., 1959).

Marketing research is the systematic collection and collation of merchandising information. It can be no substitute for management decisions, but can be used by management to obtain information upon which marketing decisions in part may be built. It uses various scientific tested techniques from trend-curve fittings and correlation analysis for the assessment of consumers' subjective attitudes toward products. It may be concerned with the internal dissection of sales information or with the analysis of industry-wide statistics in order to determine a particular company's relative trading position. Marketing research has been applied to the paper industry in the U.S.A., Canada, Great Britain and Australia to establish present consumption levels, forecast future consumption, analyze trends in the use of various papers, and study new markets for possible new uses of existing papers. Some of the work which has been carried out in Australia and some of the general conclusions which have been suggested by market research are discussed.

Lignin Determination—Germany

JAYME, GEORG, and RAPP, GERDA. Rapid determination of lignin in semichemical pulps. Das Papier 13, no. 23/24: 607-8 (Dec., 1959)d. [Ger., Fr. and Engl. sum.]

The rapid lignin determination method developed earlier (*cf.* A.B.I.P.C. 29:535), based upon the application of a mixture of sulfuric and phosphoric acids at 35°C., has been applied to the determination of the lignin content of 16 semichemical pulps made from 6 different woods and containing 13-27% lignin. The method was found to be well suited for this purpose with only minor modifications. The modified method is described in detail.

Hot Alkali Refining—Sweden

ASSARSSON, A., STOCKMAN, L., and THEANDER, O. Some aspects of hot alkalki refining of pulp. Svensk Papperstidn. 62, no. 23: 865-75 (Dec. 15, 1959). [Engl.; Swed. and Ger. sum.]

A chlorinated spruce sulfite pulp (89.8% *a*-cellulose content) was subjected in 1% consistency to conventional hot alkali refining using 0.04 *N* sodium hydroxide solution, to a similar treatment using 0.04 *N* calcium hydroxide solution and to the normal treatment with addition of sodium borohydride or with preceding sodium chlorite oxidation. As reported previously, all three modified treatments reduce the losses of cellulose; in addition, they increased the efficiency of refining to some extent. Relatively small amounts of borohydride or chlorite were effective. Chlorite pretreatment gave the best results; it was also superior to the other treatments in that the time of refining at low chlorite concentration did not have to be extended beyond the conventional period in order to reach a predetermined alpha-value. Studies of the properties and carbohydrate compositions of the refined pulps indicated that the modified procedures imparted greater hot-alkali stability to the cellulose than to the hemicellulose components. However, since xylose and mannose are known to be more reactive to chlorite oxidation than is glucose, the selective effect obtained with sodium chlorite in particular—but also with borohydride and calcium hydroxide—is due to differences in accessibility. These differences are most significant when the chemicals used to stabilize the end-groups are added in small amounts. However, differences in the structure and properties of the different polysaccharides (e.g., in degree of branching, carbonyl and carboxyl contents, rate of alkaline degradation, diffusivity, and sorption or recrystallization) may also play an important part. 23 ref.

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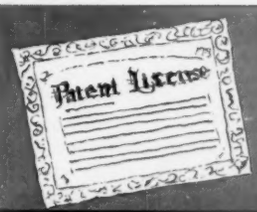

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If one of our patents can help you, we'll be glad to license the rights to you **perpetually,** for just one dollar. You get a nice certificate, incidentally, to cover the legalities, but more important – you also get free our complete engineering help in setting up your process, handling the material, maintenance, etc., etc.

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Years of experience in paper and pulp processing have produced a library of technical information which is available in individual bulletins, free on request. Use the coupon below to let us know which you'd like to receive.

- **No. 31 — Groundwood Bleaching Variables — A Statistical Approach.**
- **No. 32 — H_2O_2 Bleaching of Chemicals and Mechanical Pulps.**
- **No. 47 — Peroxide Bleaching of Pulps.**
- **No. 48 — High-Density Pulp Bleaching.**
- **No. 64 — Development Studies on Last-Stage H_2O_2 Bleaching of Alkaline Pulps.**
- **No. 65 — Peroxide Bleaching of Southern Pulps.**
- **No. 66 — Becco Laboratory Procedures for Pulp Bleaching, 1955 Ed.**
- **No. 91 — Peroxide Bleaching of Chemi-Mechanical Hardwood Pulps.**
- **No. 92 — Peroxide Bleaching of Chemical Pulps.**

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Looking for a way to use greater amounts of low-cost, more plentiful pulp—without capital investment for bleach equipment? Then let a Becco Sales Engineer show you our new technique* which allows you to bleach in the same equipment regularly used for the manufacture of cold caustic pulp.

In this new process, peroxide bleach liquor is added at the Bauer Refiner, and bleaching occurs during the refining operation. Bleach response depends on refiner densities.

Up to 20 points brightness increase has been obtained in commercial operations to date, and with no additional steam costs, no holding time, and no excessive chemical costs.

Becco can assist you immediately in setting up a production run and evaluating results. First step: use the coupon to let us know you're interested.

*—Patent Pending

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Please have a Sales Engineer give me more information on Becco's Cold Caustic Bleach Process.

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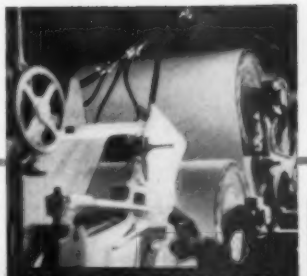

How BRIGHT Is BRIGHT?

That's a hard question to answer. It depends on how the pulp is treated.

Trouble is, paper can show an 86 level at the layboy, but by the time the paper is delivered, this has dropped to 82 or lower. With conventional bleaching methods, that is.

Many chemical pulp producers have found the answer to this problem in Becco's Dryer Steep Bleaching Process (patented, but licensed perpetually for one buck). Applied by means of spray pipes across the pulp sheet ahead of the dryers, Becco Hydrogen Peroxide increases brightness permanence and bleaches in transit. Often, in fact, an 86 layboy level improves to 88 by delivery time.

This is just one example. Becco has a vast amount of technical knowledge compiled from 31 years of experience with all types of pulp. If you'd like help with your pulp, free of any obligation, let us know with the coupon below.

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of the LINDSAY TECHNICAL SERVICES STAFF and SALES REPRESENTATIVES

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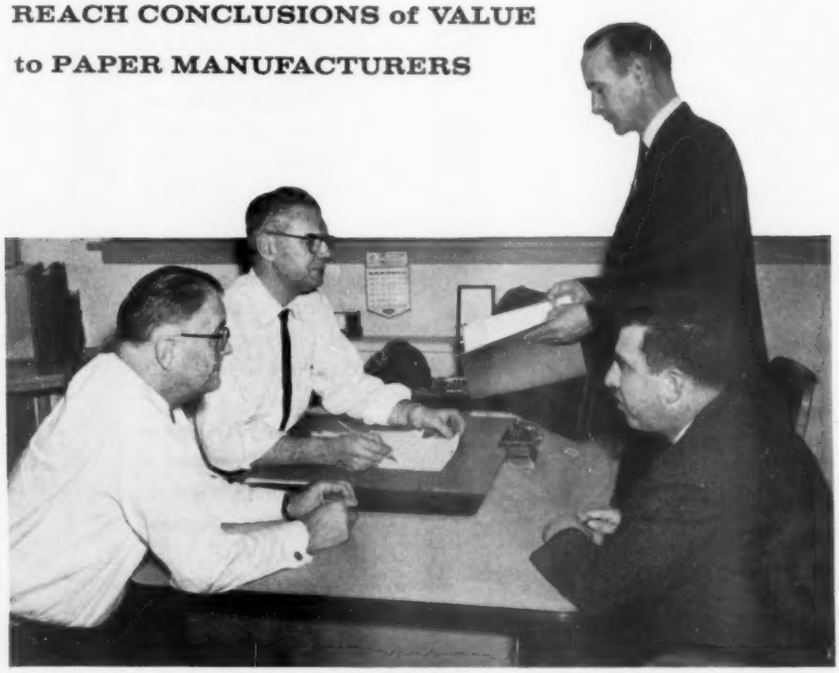

Left to right—Hugh Quinn and Cass Cook, Technical Services; Keith Forbes (standing) and George Wennes, Sales Representatives.

Lindsay sales representatives have frequent occasion to meet with members of the Lindsay Technical Services Division in Cleveland. *Purpose:* to discuss real conditions and find practical answers to problems which arise in the plants of paper manufacturers.

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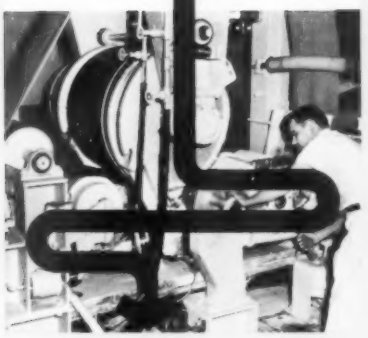

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coating improved by Double-Wet* application

Whether by roll application, air knife, or various trailing blade arrangements, Beloit's laboratory coating unit "proves its point" before a commercial installation is made. This type of coating research . . . in the area of advanced coating design . . . provides an essential saving in today's highly competitive coated paper and board markets. Beloit research engineers daily meet the demand for improved coating applications on grades ranging from the lightest sheet to the heaviest board grades—coating at speeds in the 3000 fpm range. Beloit "paperesearch" means *paper progress*—more efficient machines, always better paper.

AIR KNIFE FOLLOWING TRAILING-BLADE WITHOUT INTERMEDIATE DRYING

*PAT. APPLIED FOR

PHOTOS BY S. R. CHRISTENSEN

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Working with conventional dyes as well as certified colors, we are engaged in intensive research, independently and in cooperation with the chemical and paper industries, to solve the many problems that still exist in coloring food papers under the Food Additives Amendment.

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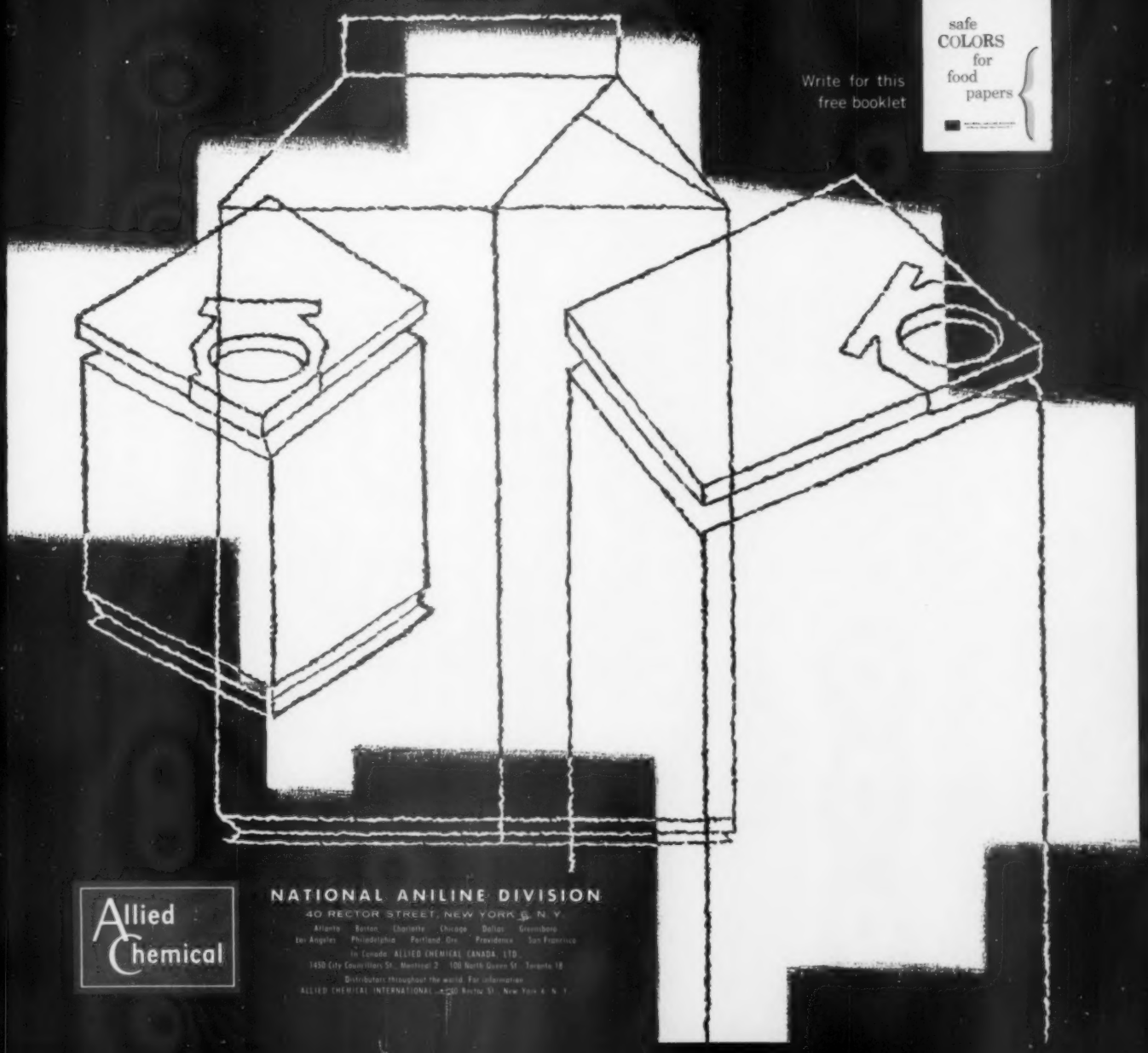

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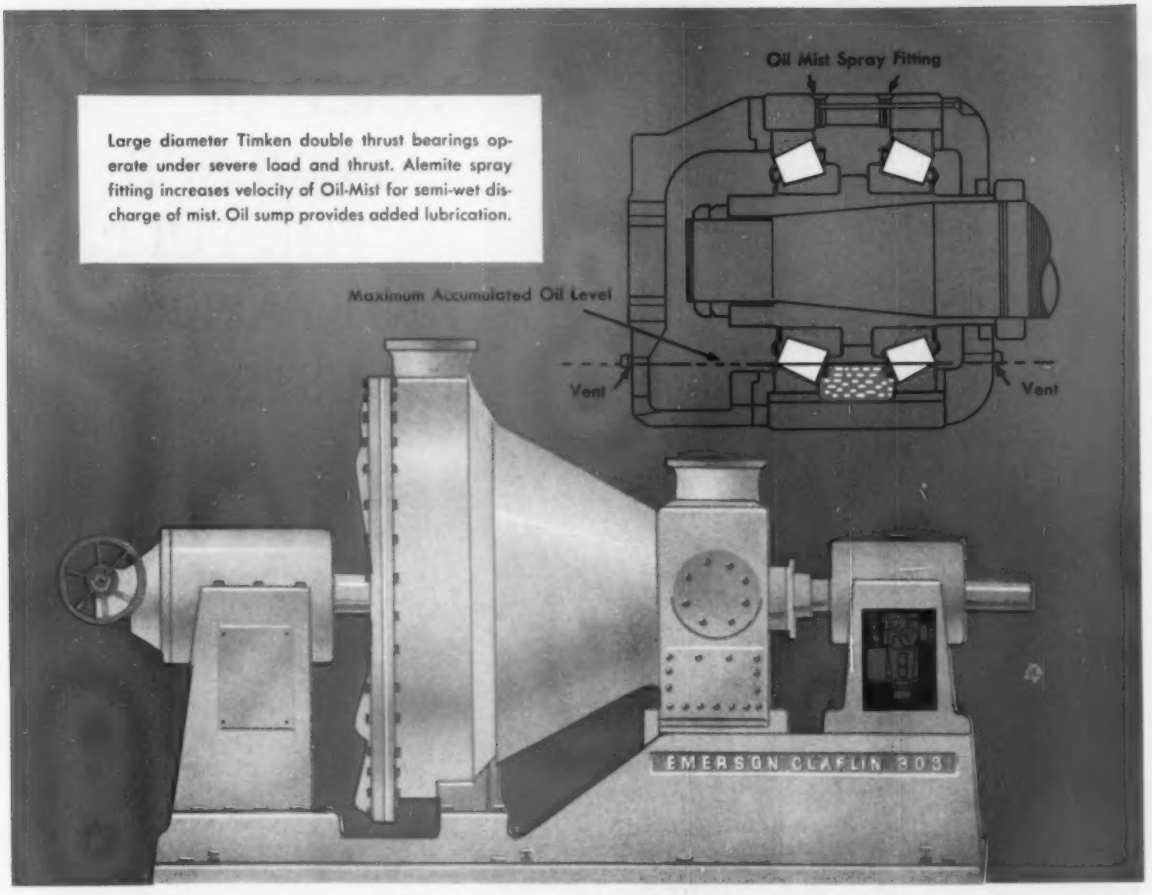
Large diameter Timken double thrust bearings operate under severe load and thrust. Alemite spray fitting increases velocity of Oil-Mist for semi-wet discharge of mist. Oil sump provides added lubrication.
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Right at the planning stage, Emerson Manufacturing made sure that its new, multi-purpose Model 303 Refiner would offer outstanding built-in lubrication advantages. This leading supplier of refining equipment designed an Alemite Oil-Mist System into its new refiner!

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Net result: longer bearing life, elimination of lubrication down-time, and as much as 90% less oil consumption for 303 owners!

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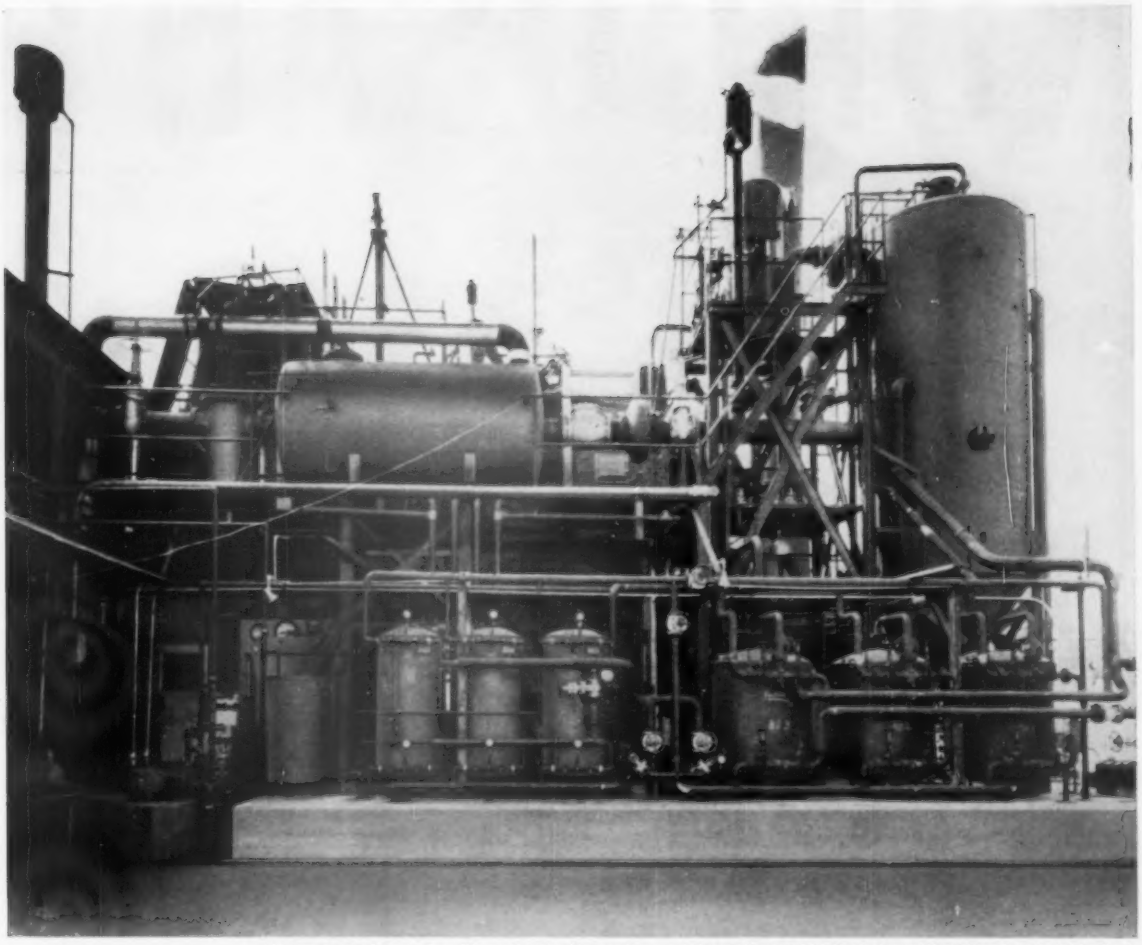


6000-gph hot lime–hot zeolite water-treating system and deaerator installed at a large West Coast industrial plant.

Hot process - hot zeolite system

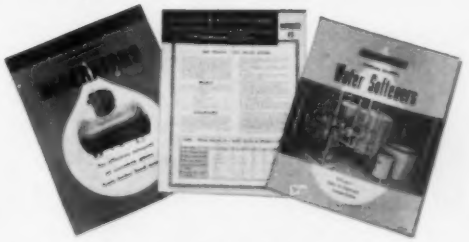
eliminates boiler sludge and scale

Zero hardness in the effluent — result of Allis-Chalmers highly effective hot process-hot zeolite system — means scale and sludge-free operation of your boilers, economizers, feedlines, feed pumps and feedwater heaters.

In addition to zero hardness, the low alkalinity, silica and solids, and high pH of the effluent make the combined hot process and zeolite systems suitable for makeup to boiler cycles operating at pressures as high as 900 psig.

Your nearby A-C water conditioning engineer can give you further system details or arrange for a proposal or water analysis. ***Allis-Chalmers,*** *Water Conditioning Department, Milwaukee 1, Wisconsin.*

A-1245



One source for all water conditioning facts, chemicals, equipment, service! Write for free hot process-hot zeolite bulletin 28X7559 . . . zeolite water softener bulletin 28B7107A . . . and deaerator bulletin 28B8853.

A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

NOPCOSANT®

...for pitch dispersing

...for slime control

...for size stabilizing

...for coating fluidizing

...for uniform dyeing

You will find it worth your while to get all the facts about Nopcosant—Nopco's newly improved dispersant and solubilizer. Ask your Nopco representative or write for complete information. Remember, too, back of every chemical made by Nopco for the paper industry stands Nopco Technical Service—an experienced staff ready to assist with laboratory data and recommendations based upon your specific requirements.

Properties of NOPCOSANT

A fine powder of uniform particle size

★

Dusts less than any other similar product

★

Lightest colored product of its type

★

One of the most rapidly dissolving products available

★

Most nearly natural *p*H in its chemical class

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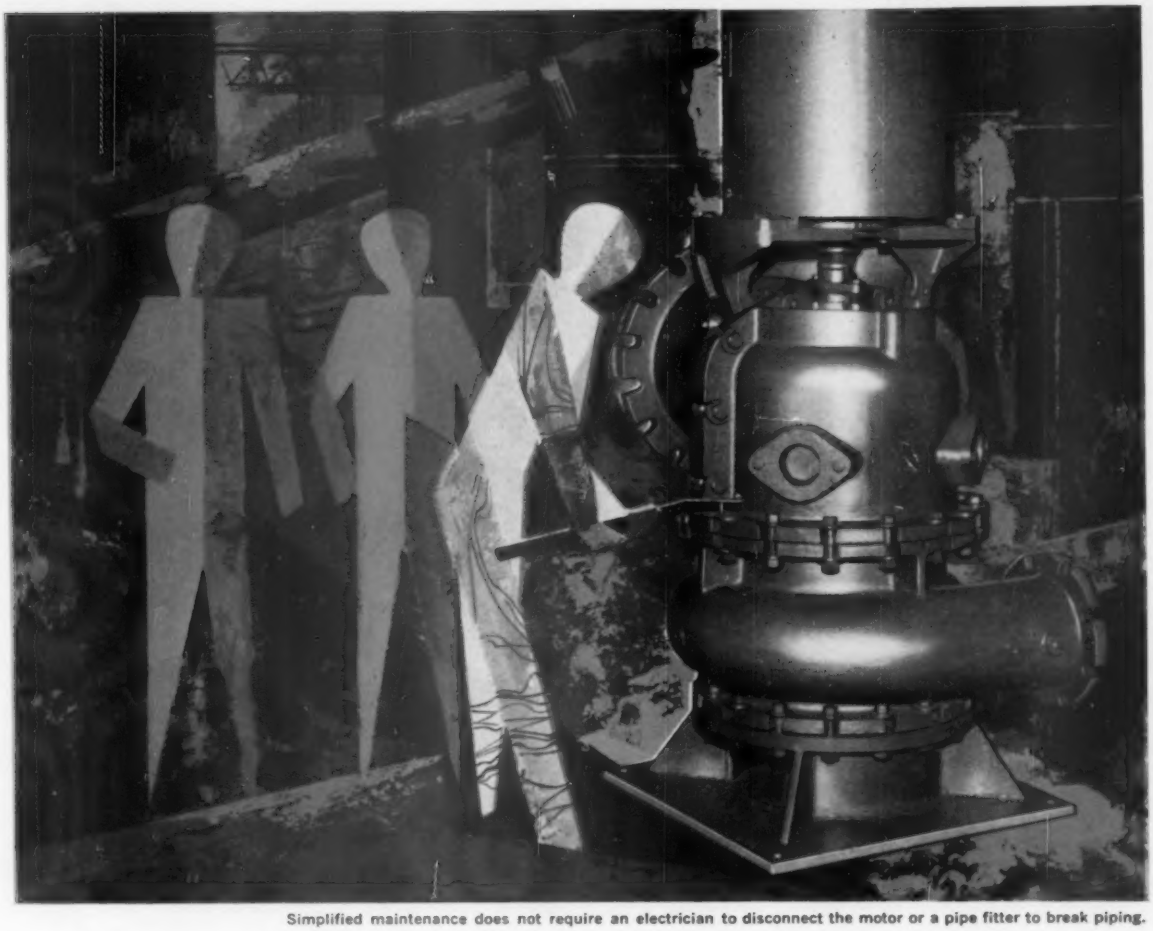
60 Park Place • Newark, N.J.

NOPCO®

Plants:
Harrison, N.J. • Richmond, Calif. • Cedartown, Ga. • London, Canada

ALLIS-CHALMERS



Simplified maintenance does not require an electrician to disconnect the motor or a pipe fitter to break piping.

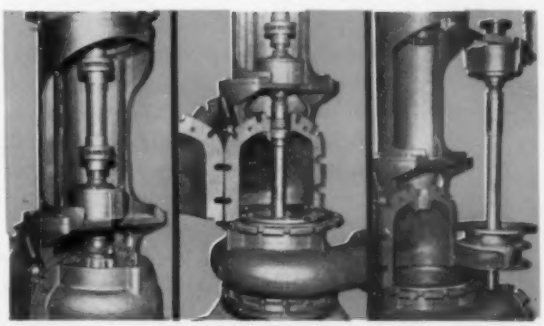
NEW vertical paper-stock pump features one-man maintenance

saves space — saves time — saves costs

New space-saving vertical design cuts your pump space requirements by as much as one-fourth. The easy accessibility to internal parts — usually found only in horizontal pumps — helps reduce maintenance time. Maintenance costs are reduced because one mechanic is all you need to do the job.

A-C's new pump is designed with a removable coupling guard, spacer coupling and a vertically split suction elbow. To disassemble, merely take off the guard and elbow section, and remove the spacer coupling. The rotating element can then be lifted free of the pump.

If space is a problem, see how easily this vertical pump can solve it. And cut maintenance costs and downtime at the same time. Contact your A-C representative or write **Allis-Chalmers,** *Milwaukee 1, Wisconsin.* A-1372



Guard removed, spacer coupling exposed | Section of suction elbow removed | Entire rotating element removed

Leadership in Paper Making Chemicals

WHEN SHE'S A GREAT-GRANDMOTHER THIS BOOK WILL BE "LIKE NEW"

Books like "Sleeping Beauty" have been bringing a smile to children's faces for generations. But the casualty rate is high . . . continual reading soon takes its toll and the book must be replaced.

Now there is a way to manufacture book paper that will last as long as 300 years under the conditions of everyday use. This paper was developed by the well-known restorer of documents, W. J. Barrow, under a grant to the Virginia State Library by the Ford Foundation's Council on Library Resources.

Only an alkaline-sizing agent could be used, and Aquapel® sizing agent was the logical choice. Aquapel is more than a conventional paper size. It becomes an integral part of the paper. Since it is on the alkaline side, the paper is stronger and more durable.

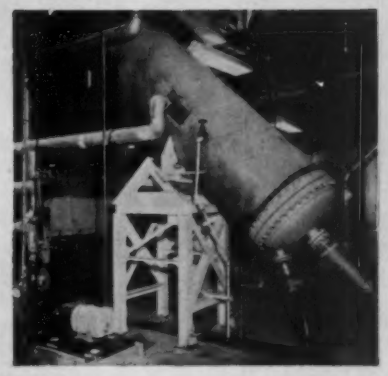
Paper Makers Chemical Department
HERCULES POWDER COMPANY INCORPORATED
900 Market Street, Wilmington, Delaware

PP60-4

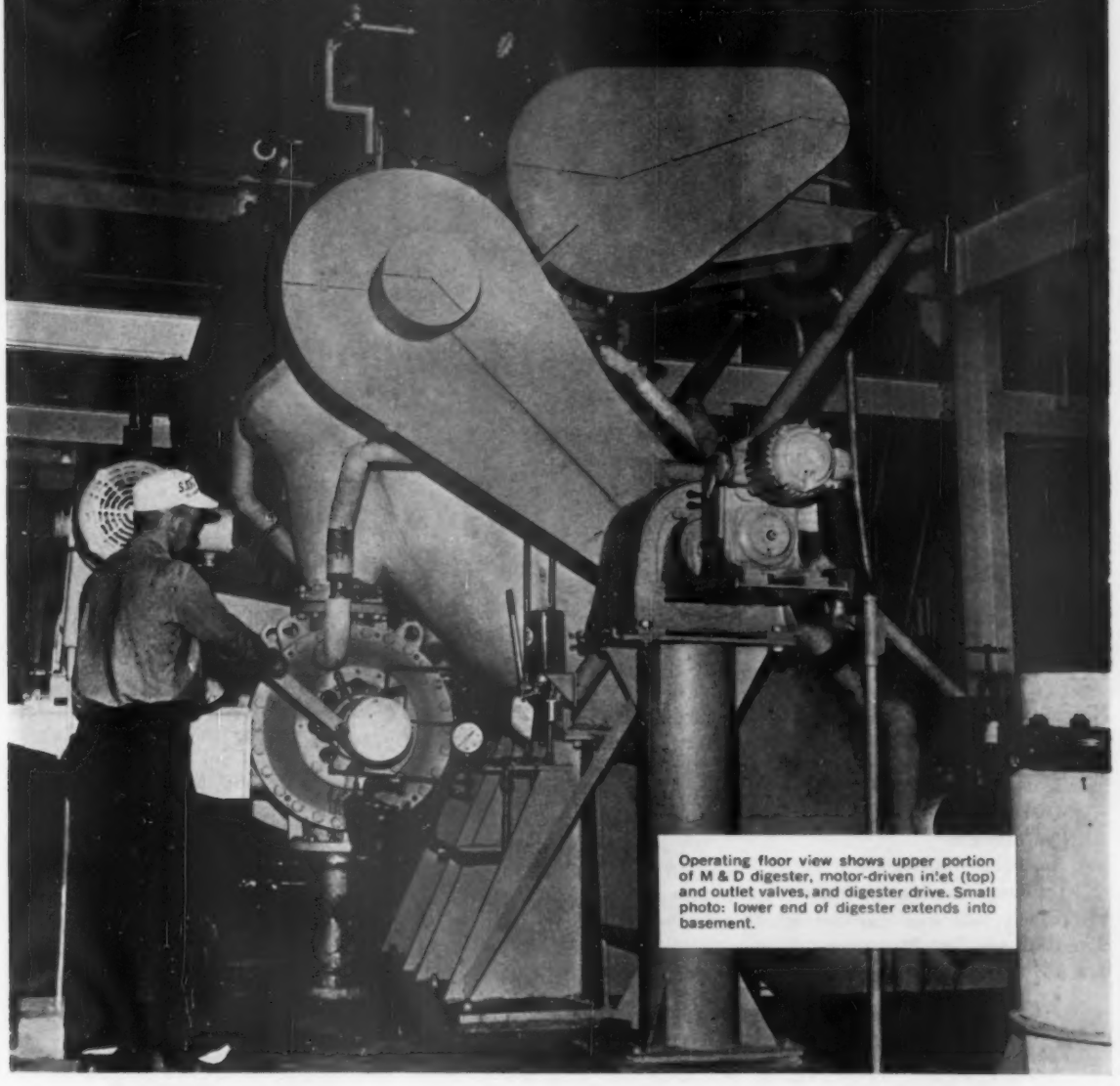
Bauer pulping and refining equipment in Blandin chemi-mechanical pulp mill

Bauer equipment plays an important role in the 4-million dollar quality improvement program at Blandin Paper Co., in Grand Rapids, Minn.

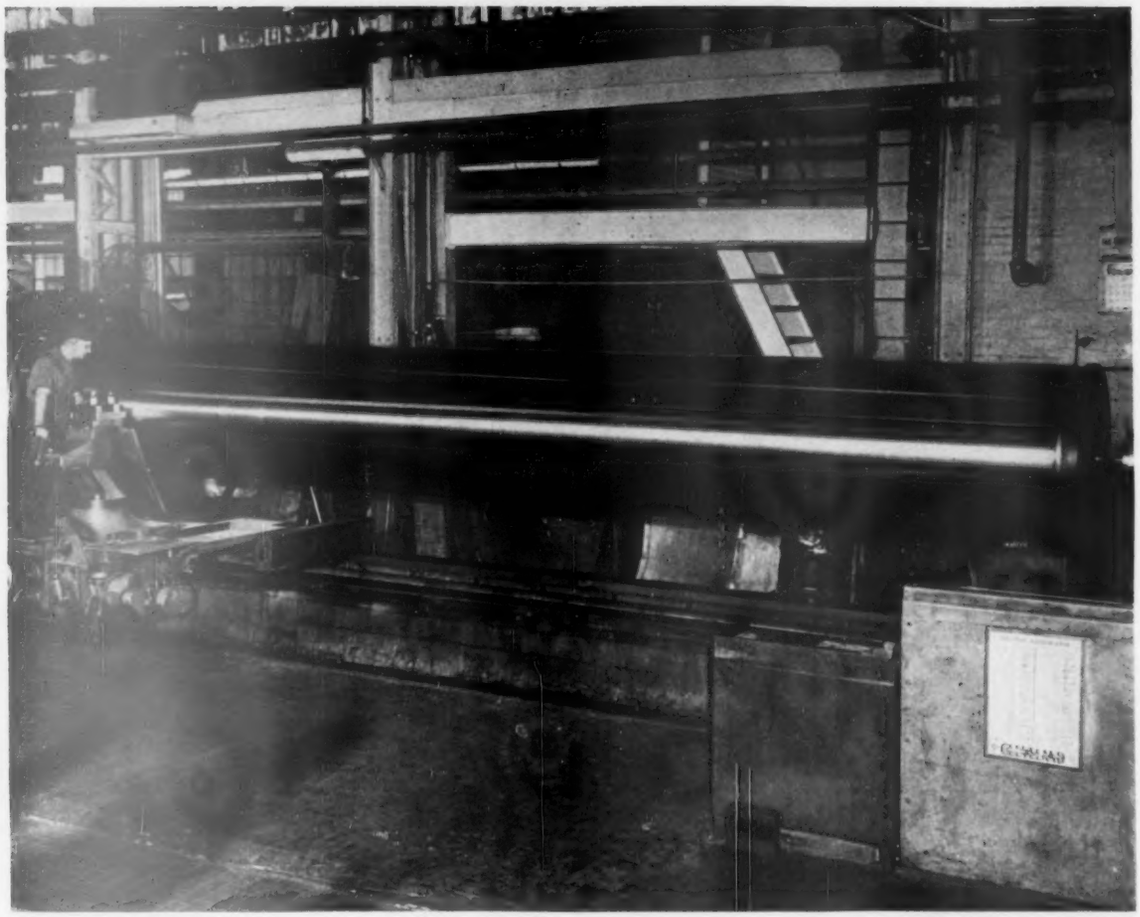
In the company's new chemi-mechanical pulp mill, chips are cooked automatically and under pressure in a Bauer M & D Continuous Digester. This inclined, space saving unit provides uniform cooking on a continuous basis and facilitates maximum efficiency of subsequent operations. These include moisture removal and preliminary fiberizing in a Bauer Pressafiner, then refining in Bauer double revolving disc refiners, final stock preparation in a Bauer Pump-Through refiner, and cleaning in Bauer Centri-Cleaners. Bauer equipment can help improve quality and production in your mill, too. Ask for details.



THE BAUER BROS. CO., Springfield, Ohio



Operating floor view shows upper portion of M & D digester, motor-driven inlet (top) and outlet valves, and digester drive. Small photo: lower end of digester extends into basement.



BIG AND TOUGH — One of the largest stainless steel centrifugal castings ever produced, this suction roll is more than 26 feet long and 3½ feet in diameter. The huge roll is made of A.C.I. Type CF 8M stainless steel (19% Cr, 11% Ni, 2.5% Mo) which has shown excellent corrosion resistance in white water at 30 representative paper mills.

Strong on corrosion resistance

21-ton Nickel stainless steel roll stays smooth, provides improved suction

Nickel stainless steels combine excellent corrosion resistance with at least *four* other important characteristics:

- **High strength**
- **Stiffness**
- **Good machinability**
- **Long wearing qualities**

That's why cast stainless steel suction rolls are fast becoming favorites with operators of high speed paper machines...

Their high strength and greatly reduced need for corrosion allowance make possible lighter walls, further increasing suction efficiency.

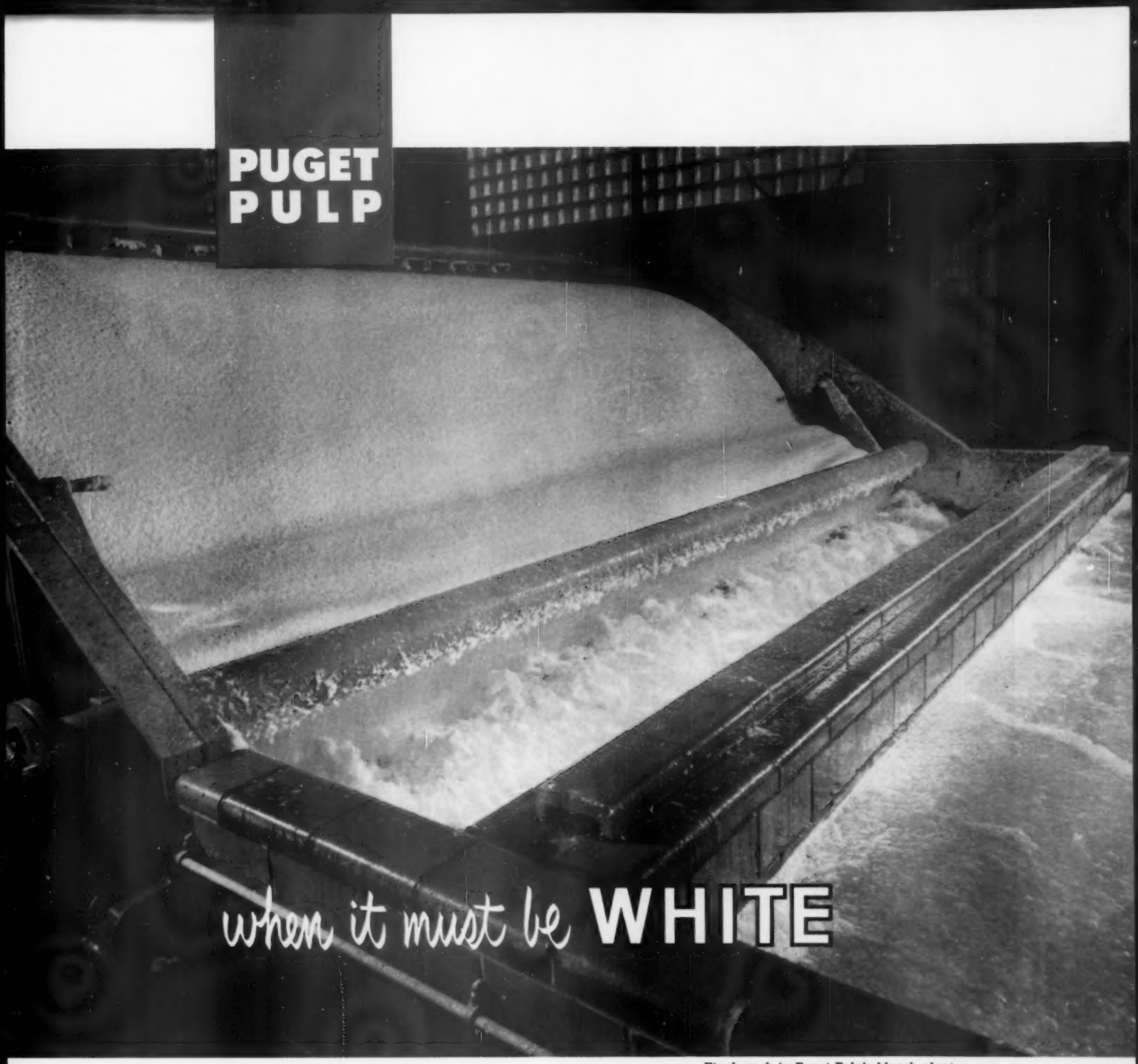
What's more, the rolls keep a smooth surface longer and need reaming less frequently. There's a minimum of fibre build-up and slime accumulation to cause slowups or shutdowns.

Have you a problem that a stainless steel casting might solve? Easiest way to find out is to write for our valuable booklet, *Heat Resistant Castings, Corrosion Resistant Castings, Their Engineering Properties and Applications.* It's free on request. Just ask for "Booklet A-266."

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street New York 5, N. Y.

INCO NICKEL

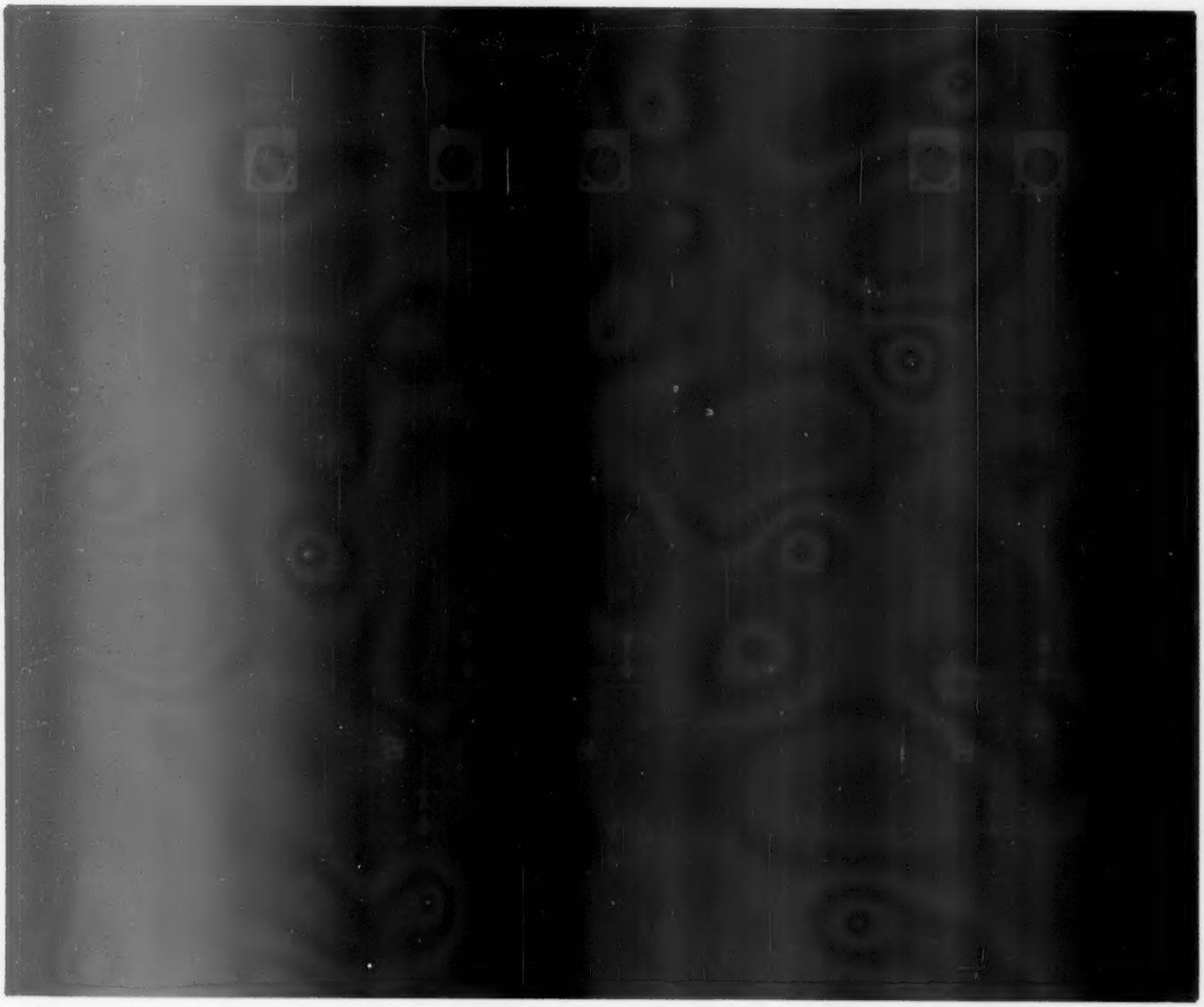
NICKEL MAKES ALLOYS PERFORM BETTER LONGER



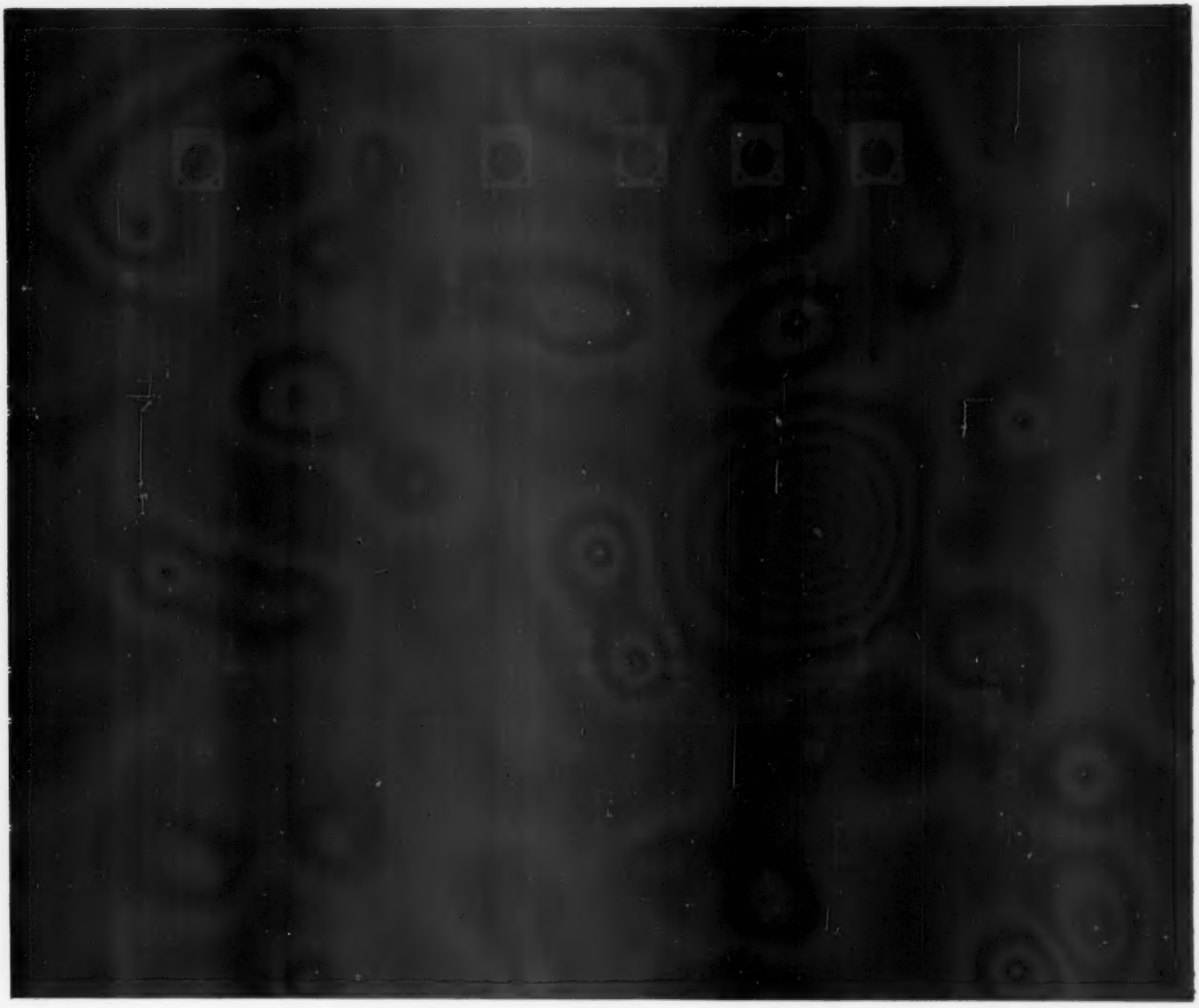
Final wash in Puget Pulp's bleach plant

start with PUGET PULP...
...the uniformly strong, clean, white
chlorine dioxide bleached
softwood sulphite

PUGET SOUND PULP & TIMBER CO.
BELLINGHAM • WASHINGTON



Quality + Efficiency in Papermaking



. . . with MASONEILAN Drying and Drainage Systems

An essential element in the production of quality papers is proper drying — obtainable only through accurately controlled steam, efficiently applied to driers.

Masoneilan Drying and Drainage Systems are individually engineered for each paper machine to provide accurate control of steam pressure to the driers and continuous evacuation of condensate, air and non-condensables from all driers, through means of closely controlled differential pressures. This insures improved paper quality, reduced tonnage losses, maximum drying efficiency, and increased machine speed and flexibility.

These systems are available for Single and Multiple Section Paper Machines and for Yankee Driers, including Warm-up Control and Automatic Surface Temperature Control. Mason-Neilan engineers the systems and furnishes all equipment and controls — one source and undivided responsibility — for both new and rebuilt machines.

Send for Bulletin PD 113 . . .
for descriptions of basic Masoneilan Control Systems and related equipment; and for cooperation in engineering, contact a Masoneilan representative or write direct.

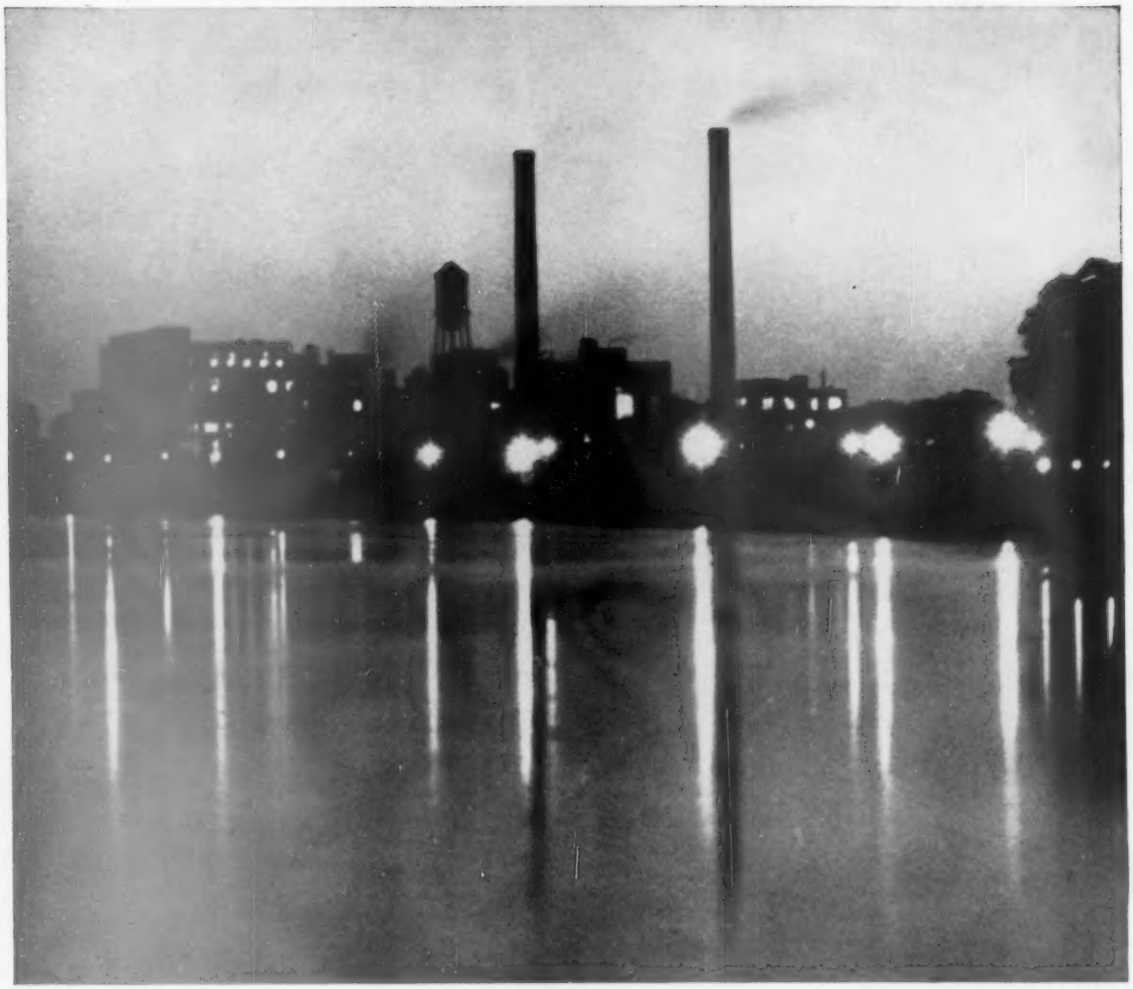
MASON-NEILAN

Division of Worthington Corporation

65 NAHATAN ST., NORWOOD, MASSACHUSETTS

Sales Offices or Distributors in Principal Cities in United States and Abroad • In Canada: Worthington (Canada) Ltd., Mason-Neilan Division

MNO-13



24 HOURS A DAY

A Better Paper for you with Clinton Products from Corn

When you need a starch or dextrin, check with *Clinton* first. Clinton's complete line of starches and dextrins designed for paper mill applications can mean better paper for you.

CLINTON TECHNICAL SERVICE is freely available upon request.

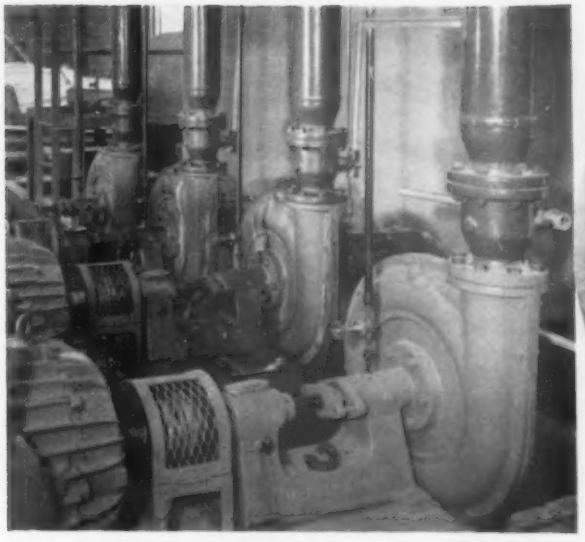
CLINTON

CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA

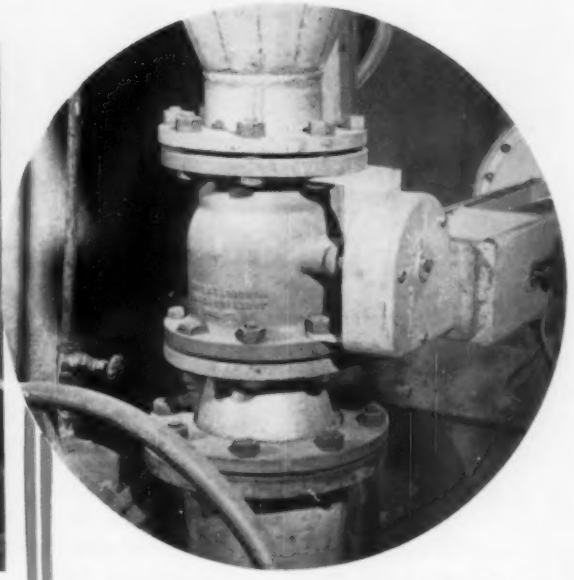
jamesbury

"Double-Seal"™
BALL VALVES*

Most VERSATILE Valve In The Mill!



Jamesbury installation at Mead Corporation Chillicothe Plant



Jamesbury installation at Weyerhaeuser Longview Plant

As varied as the valving requirements are in pulp and paper processing, the Jamesbury "Double-Seal" Ball Valve is meeting them successfully. Jamesbury offers a functional, efficient, economical Ball Valve which has proved itself in performance in many major installations such as the examples shown above.

Jamesbury Ball Valve Versatility Is Proving Itself In These and Other Services

Spent Acid Lines • Sodium Dioxide • Calcium Hypochlorite CO_2 • Sampling Lines • Stock Lines • Bleach Lines • Liquor Lines H_2SO_4 • Black Liquor Recovery Service • Kraft Mill Digester Service • Chlorinated Stock Service • Brown Water SO_2 Service Instrumentation Lines • White Water • Water & Pulp Grinder Water in Filtration Plant • Digester Gas-Off • Digester Blow Service • Vacuum Service • Power Boiler • Gas Service General Caustic Service • Alum Lines • White Liquor Fill Vortrap Drain • General Air Service • Kaolin Clay Service • Paper Filler Service • Glue & Paste Service • Pilot Laboratory • Demineralizer Coating • Color Rooms • Paper Machine Showers • Hydrogen Peroxide • Rapid Cycle Digester Service • Hydrogen Gas Service • Boiler Water Treatment System • Ash Elimination Dry Chlorine Service • Starch System.

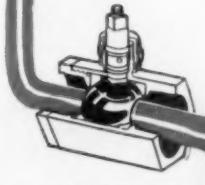
227-0 *Patented

GREATEST RANGE OF BALL VALVE SIZES AND MATERIALS AVAILABLE.

Jamesbury "Double-Seal" Ball Valves are available in Types 303, 316 and Alloy 20 Stainless Steels, Carbon Steel, Bronze, Ductile Iron, Aluminum and PVC. Other materials on special order.

Interchangeable seats and seals are available in "Teflon", Nylon, Buna-N, Neoprene, Hypalon and natural rubbers.

Pneumatic, Hydraulic and Electric Motor Operators to fit Remote Control Requirements.



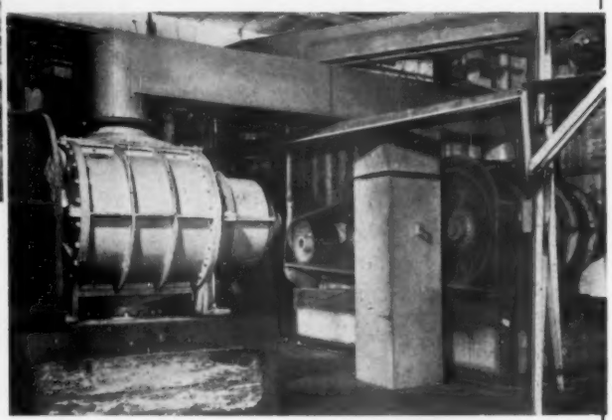
SIZES

Screwed End	¼" through 3"
Flanged	½" through 10" 150# and 300# series

Send for Jamesbury's Pulp and Paper Brochure.

JAMESBURY CORP. NEW STREET, WORCESTER, MASS.
Distributors in Principal Cities

415,000 tons of chips delivered in 5½-year period!



Rader system at Pope & Talbot mill moves chips 4700 feet in one operation

High-quality pulping chips are an important by-product of the large Pope & Talbot lumber mill at St. Helens, Oregon. One mile to the southeast on the Columbia River is a ready-made customer for all the chips Pope & Talbot produces—the integrated pulp-and-paper mill of Crown-Zellerbach Corporation.

A high-capacity pneumatic conveyor system, installed by Rader Pneumatics in 1954, and put into operation in January, 1955, makes it possible for Pope & Talbot to move its entire output of chips all the way to the Crown-Zellerbach mill in a single 4700-foot "air lift." Since the system went into operation, approximately *415,000 tons of chips* have been delivered to the customer!

"The Rader system does the work of three or four large tractor-trailer combinations, at far less cost," says Harvey Hawkins, manager of the Pope & Talbot mill. "The system operates continuously, eight hours a day, when the mill is going. It carries chips away as fast as the chipper turns them out, so we have no storage problem. Both the band mill and the gang mill send their scraps to the chipper; as a result, there is virtually no waste."

Nor is there any "down time" on the Rader system. The only interruption came when plant expansion caused the pipe to be relocated, and the only pipe to be replaced was two sections which were damaged by a bulldozer. Even when 1000 feet of pipe was under three feet of water during a Columbia River flood, the system operated continuously during working hours at the mill.

PHOTOS: Upper left, conveyor pipe looking southeast toward Crown-Zellerbach mill, in background; camera is about 1000 feet down the pipe from the blowers. Lower right, twin blowers powered by 250-hp electric motors send air through "T" connection to conveyor pipe, located beneath floor.

Write for information on how Rader can meet your own requirements.

RADER PNEUMATICS

1739 N.E. 42nd Ave., Portland, Oregon
Box 3386, Memphis 17, Tenn.
4645 Main St., Vancouver, B. C.
Box 397, Pembroke, Ont.

Representatives in:
Eureka, Calif.; Tustin, Calif.; Lockport, Ill.; Syracuse, N. Y.; Boston, Mass.; Charlotte, N.C.; Charleston, S.C.; Preston, Ont.; Montreal, Que.

In England as well as in the U.S.A. . . .

papermakers use and like

RIEGEL PULPS

CHLORINE DIOXIDE BLEACHED

ALBACEL
Bleached Softwood

MIRACEL
Prehydrated Bleached Softwood

ASTRACEL
Bleached Hardwood

HYDRACEL
Prehydrated Bleached Hardwood

Throughout the free world, papermakers use and like Riegel Pulps . . . paper-grade pulps that provide the right balance of all important qualities . . . brightness, cleanliness, strength, formability and proper beating characteristics.

BALANCED PAPER-GRADE PULPS . . .

Created *BY* Papermakers *FOR* Papermakers

Riegel Paper Corp., 260 Madison Ave., New York 16, N.Y.

SMIDTH
Rotary Kilns

For Reburning Lime Sludge

We are specialists in the design and manufacture of rotary kilns, coolers and auxiliary equipment for burning lime, lime sludge and for many other purposes.

Over 1,250 Smidth rotary kilns have been furnished all over the world.

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Clark-Aiken MACHINERY

sets the pace at

Bergstrom

PAPER COMPANY

NEENAH, WISCONSIN

CLARK-AIKEN machinery . . . engineered to meet today's finishing room requirements . . . is your guarantee of greater production, lower costs and uniformly high quality!

Place your finishing room production problems in the hands of Clark-Aiken engineers with complete confidence. Realize important savings and improve your competitive position through a practical automated operation based on the latest operating techniques and up-to-date machinery. Maintain quality with modern equipment that is geared to deliver top production around-the-clock. Clark-Aiken equipment coupled with Clark-Aiken engineering to individual requirements assures you better control of **your** finishing room production. Whatever your finishing room problem may be — consult Clark-Aiken for prompt and interested consideration.

Mr. Lawrence J. Zielinski, finishing operations supervisor and Mr. Walter Akstulewicz, sheeting department supervisor, Bergstrom Paper Company, Neenah, Wisconsin have this to say about their Clark-Aiken sheeters:

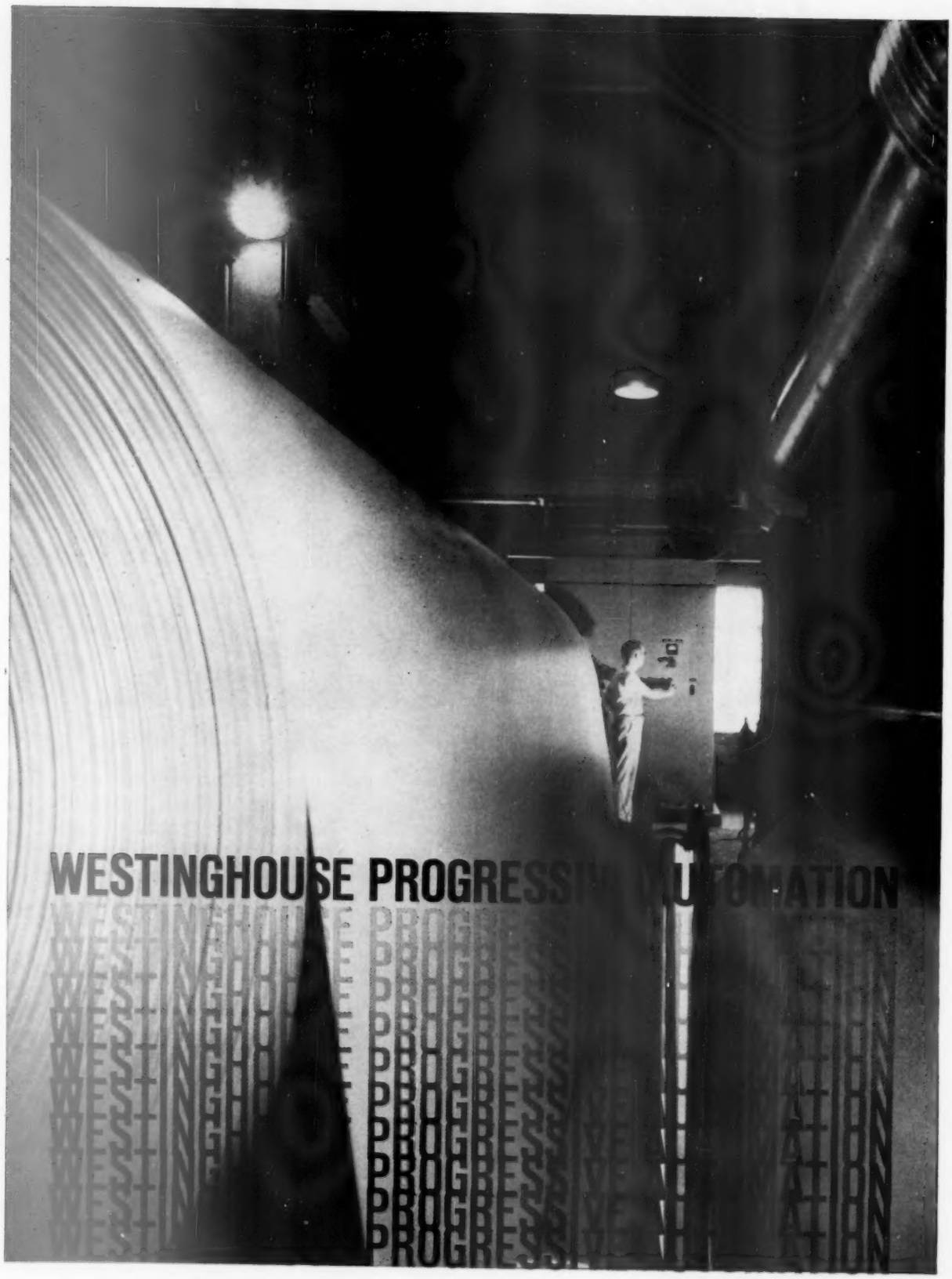
. . . "Our two Clark-Aiken sheeters operate at varying speeds providing efficient sheeting performance with a minimum amount of maintenance."

THE *Clark-Aiken* COMPANY

957 SPRINGFIELD ROAD

LEE, MASSACHUSETTS

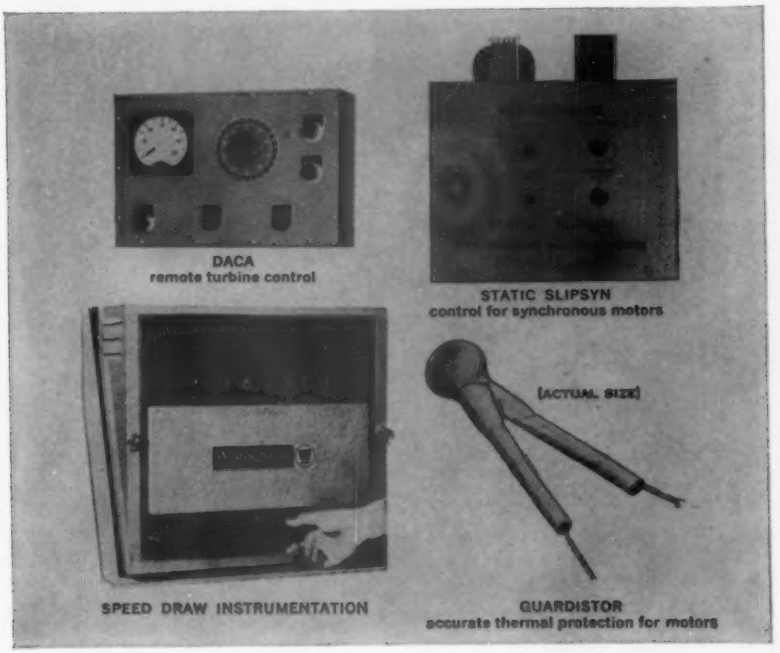
CANADIAN REPRESENTATIVE: GORDON W. KEATES, 133 FLORA DRIVE, SCARBOROUGH, ONTARIO


WESTINGHOUSE PROGRESSIVE AUTOMATION

A PRACTICAL, STEP-BY-STEP PROGRAM TO RAISE PRODUCTIVITY, IMPROVE PRODUCT QUALITY

Westinghouse *Progressive Automation* is a step-by-step program to help you reach your goals as economically as possible . . . and is thoroughly practical because it is tailored to your mill. Through *Progressive Automation*, many mills have already increased output, reduced off-grade losses through better quality control.

Westinghouse is ready today to help you plan and execute your next step in automatic production. We are prepared to recommend, furnish, install and maintain all equipment to fulfill your plan. For the first time, you are offered one source for all controls, computer systems and all other basic electrical equipment for paper mills . . . transformers, switchgear, motors, gearing, drives. You can be sure . . . if it's Westinghouse.



DACA . . . ULTRA-PRECISION IN PROVIDING AND CONTROLLING POWER Turbine-driven paper machines are now being controlled by the most precise equipment ever offered the industry—DACA* (Digital Analog Control Apparatus). Rapidly rising standards of paper quality require exact control of machine drives over a wide range of speeds. Here's how DACA meets this need. First, DACA holds line shaft drives to plus or minus 0.1% of preset speed through a 10-to-1 speed range. Second, a preset control gives automatic, precise speed selection throughout this speed range. DACA combines the best features of digital and analog techniques and uses static circuitry to provide high reliability . . . less down time.

SPEED-DRAW INSTRUMENTS . . . UPGRADE EFFICIENCY, ACCURACY OF NEW OR EXISTING MACHINES The objective of this Westinghouse instrumentation—and to date the only practical equipment available—is more precise production control and reduction of off-grade losses. With digital readout, operators know the speed of any machine section at any time. Digital circuitry eliminates drift and, therefore, error. Either speed or draw is read to within one foot per minute, or 0.1 fpm. Both readout and printout devices are available.

SLIPSYN CONTROL . . . THE FIRST AND ONLY STATIC DEVICE FOR ACCURATE CONTROL OF SYNCHRONOUS MOTORS New Westinghouse Static Slipsyn® Control precisely applies motor field excitation at proper speed and pole position up to and including 99% of synchronous speed. Transistorized networks throughout provide a new measure of reliability for automatic production. There are no moving parts to wear, corrode or fail. Existing control can be easily converted to static Slipsyn.

GUARDISTOR . . . STOPS MOTOR FAILURE CAUSED BY EXCESS HEAT The exclusive new Westinghouse Guardistor* motor gives you direct, accurate thermal protection against motor burnout. A PTC (positive thermal coefficient) thermistor, no larger than an aspirin, is embedded in motor windings, senses temperature rise instantly. At a predetermined critical temperature, thermistor has an approximate 100-to-1 change in resistance, activating the predetermined control function to stop failure.

For details on other Westinghouse apparatus for paper production, turn the page . . . *Trade-Marks

Westinghouse

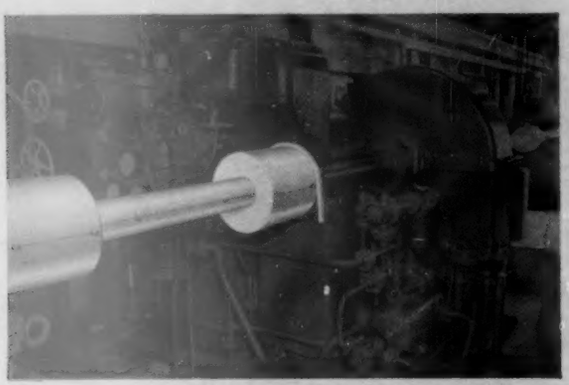
ADDITIONAL WESTINGHOUSE PRODUCTS FOR THE PAPER INDUSTRY

WESTINGHOUSE STEAM TURBINES . . . PRECISE SPEED REGULATION OVER A 10-TO-1 RANGE For mechanically driven paper machines, Westinghouse variable speed turbines have long proved to be the ideal power source. Extremely close speed regulation is the key to making high-quality paper . . . and this turbine provides it over a 10-to-1 and greater range. Same regulation advantages are inherent for driving multiple generator sets on sectional drive.

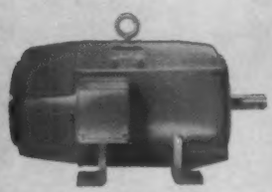
NEW D-C MOTOR . . . 35% INCREASE IN COMMUTATING ABILITY Newly designed, the Westinghouse totally enclosed Life-Line® "H" d-c motor now gives you even higher performance, as measured by a 35% increase in commutating ability, and a new armature, cutting inertia 55%. The result is faster response, improved insulation and ventilation.

LIFE-GUARD . . . FROM INSIDE OUT, MAXIMUM PROTECTION AGAINST MOISTURE, CHEMICALS Life-Line "A" motors, the familiar work horses of industry, now have the super-protection of new Life-Guard* insulation on drip-proof motors. Consists of a completely new vacuum-impregnated epoxy encapsulation of all windings. Standard Life-Line "A" motors are protected by dependable Bondite-Mylar† insulation, giving you twice the life expectancy of conventional insulations.

†DuPont Registered Trade-Mark

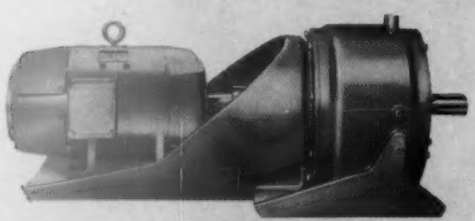


WESTINGHOUSE STEAM TURBINE



LIFE-LINE "H"
D-C MOTOR

LIFE-LINE "A"
A-C MOTOR



MODULINE GEARING

CONTROL CENTER

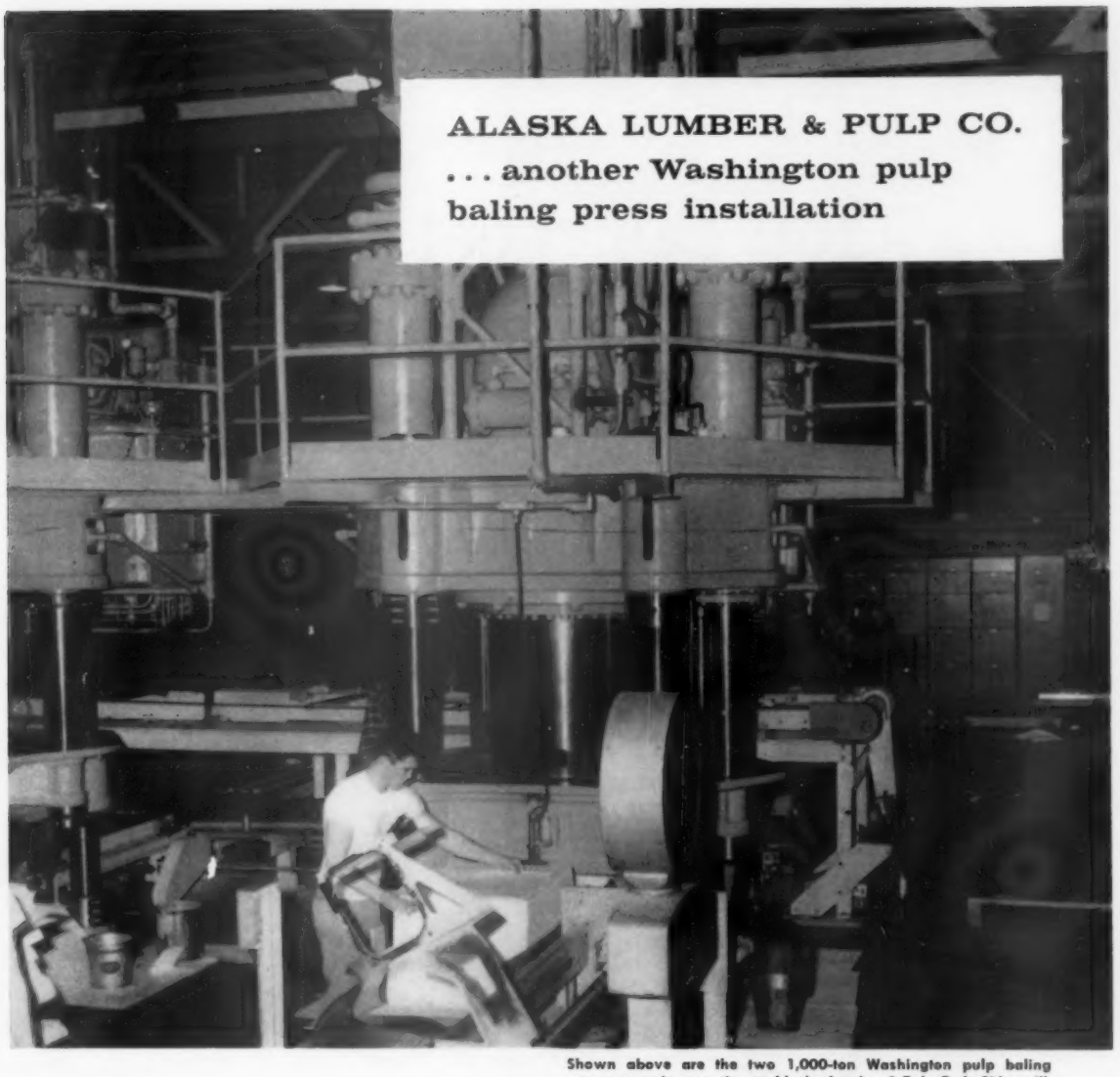
MODULINE GEAR UNITS LET YOU CHANGE GEAR RATIOS RIGHT IN YOUR OWN MILL The modular design of Westinghouse Moduline* drives saves you time and money. Now you can change gears right in your own mill to take advantage of changing manufacturing techniques on improved processes. No more delays . . . Moduline never becomes obsolete, always permits rearranged configuration rather than expensive replacement. This is the newest member of the Westinghouse family of geared drives, reducers and gearmotors designed for the paper industry.

CONTROL CENTERS . . . FLEXIBILITY TO CREATE PRODUCTION LINES FOR TODAY AND THE FUTURE Motor controls, compactly grouped in structures such as this, free production areas, provide centralized control. Individual control units may be added, removed or replaced quickly and easily. One location speeds maintenance and service. One-man supervision means coordinated motor operation, a basic requirement for automated lines.

Your nearby Westinghouse representative can help in putting *Progressive Automation* to work for you. Give him a call, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa. You can be sure . . . if it's Westinghouse.

*Trade-Marks
J-96152-3

Westinghouse



Shown above are the two 1,000-ton Washington pulp baling presses now in operation at Alaska Lumber & Pulp Co.'s Sitka mill.

Alaska's second and newest pulp mill, at Sitka, relies upon two 1,000-ton Washington automatic pulp baling presses, similar to installations throughout Alaska, Canada and the United States. Alaska Lumber & Pulp Co. produces 340 tons of dissolving pulp daily, the entire output being baled on the Washington presses, wrapped and shipped to Japan for manufacturing into rayon and paper products. Like many other integrated operations, combining pulp, plywood or board production with logging operations, Alaska Lumber also utilizes Washington logging equipment—in this case the world's largest logging machine, a 135,000-pound Washington combination slackline and interlocking skidder.

Washington pulp baling presses, in capacities from 600 to 1600 tons, assure efficiency and dependability. Let us suggest and quote on the right installation for maximum economy in your baling operation. Write to Washington Iron Works, 1500 Sixth Avenue South, Seattle 4, Washington.

HOT PLATE PRESSES • PULP BALING PRESSES
SPECIAL HYDRAULIC PRESSES • AUTOMATIC PRESS LOADERS
AND UNLOADERS • COMPLETE DRY PROCESS HARDBOARD AND
PARTICLE BOARD FORMING LINE EQUIPMENT

WASHINGTON IRON WORKS

WASHINGTON PRESSES

and ACCESSORY EQUIPMENT

You can meet any combination of temperature and weather with J-M

- cements
- jackets
- coatings
- fills

Along with the widest assortment of industrial insulations available, Johns-Manville offers a full line of cements, jacketing materials, coatings and fills. These important accessory items have been specially developed for use with J-M insulations to withstand both high process temperatures *and* exposures to all kinds of weather extremes on the job.

Don't settle for half a specification. Let your insulation contractor furnish the right combination of Johns-Manville materials vital to the satisfactory completion of any insulation job.

More than a century's experience in development and manufacture of top quality insulating materials insures the ability of Johns-Manville to meet *any* requirements and all extremes of temperature and weather. Talk over your specific needs with your J-M representative, or write Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

JOHNS-MANVILLE

AN INSULATION FOR EVERY COMMERCIAL AND INDUSTRIAL USE

JOHNS MANVILLE JM PRODUCTS

See how J-M offers materials to match your specific needs

J-M CEMENTS are designed for insulating or finishing applications. Eight types are made for general and special purpose use from such base materials as asbestos, magnesium carbonate, diatomaceous silica, mineral fiber, expanded vermiculite, hydraulic-setting cement, etc. Temperature limits range as high as 1900F.

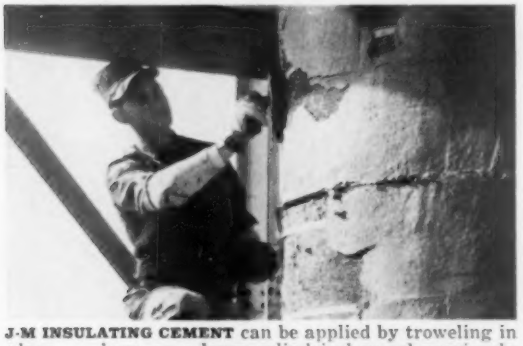
J-M WEATHERPROOFING JACKETS for fire resistance and weatherproofing can be furnished factory-applied to pipe insulations, or separately for on-the-job installation, in a wide range of thicknesses and weights. Twelve different jackets to choose from—for temperatures to 250F.

J-M INSULKOTE® weather-protective coatings guard insulation against corrosive atmospheres and extremes of weather. Insulkote can be troweled or gunned in place on vessels, tanks, piping and equipment. Available in six types, both "breathing" and "non-breathing."

J-M FILLS are recommended for insulating irregular spaces in high-temperature equipment.

Ask your J-M Insulation Contract Unit about these and the other quality insulating materials by Johns-Manville—your best assurances of long, trouble-free performance on the job.

JOHNS-MANVILLE INSULATING and finishing cements are applied over flat or irregular surfaces to give a smooth, crack-free finish that can easily be painted or given an additional weather-protective coating.



J-M INSULATING CEMENT can be applied by troweling in place . . . here, on a large cylindrical vessel previously covered with blanket insulation.

J-M WEATHERPROOFING JACKETS provide fire protection and weatherproofing as they meet any hot or cold insulating requirement. Most of the 12 available types are made of asbestos, felt-coated and saturated with asphalt.

J-M INSULKOTES can be ready-mixed and applied by trowel or spray gun over wire or Duramesh® fiber glass reinforcements. They effectively seal out moisture to prevent equipment corrosion . . . safeguard insulation investment.

GEARED TO YOUR PIPING NEEDS

NAYLOR FABRICATIONS *in*
Carbon Steel, Alloys or Stainless Steel

NAYLOR Fabrication Service can give you paper mill pipe, fittings and special fabrications to meet your exact specifications—from carbon steel, alloys or stainless steel, fabricated to close tolerances.

Pipe sizes from 4″ to 30″ in diameter and wall thicknesses from 14 to 8 gauge. Special piping fabrications from 3″ to 44″ in diameter and wall thickness up to ⅜″. Standard fittings are available from stock.

Write for Bulletin No. 59 or send specifications for quotation.

NAYLOR PIPE *Company*

1271 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

Solvay puts a customer's raw wood stock "through the mill"

Here Solvay is simulating a customer's pulping process in the "miniature mill" in their Technical Service Laboratory. Chips supplied by the customer are being loaded into a digester where, under carefully controlled conditions of temperature and pressure, Solvay® Caustic Soda will break them down into pulp for laboratory analysis. In this and other ways Solvay works with manufacturers to help improve the quality of their pulp and paper. It is just one example of technical aid to pulp and paper producers using Solvay chemicals.

Solvay can supply your needs for these chemicals from five plant locations . . . Baton Rouge, La., Brunswick, Ga., Detroit, Mich., Moundsville, W. Va., and Syracuse, N. Y. You'll get fast, economical delivery service by barge, tank car or tank truck. For more information about Solvay technical service or any of the Solvay chemicals listed, phone or write your nearest Solvay office.

SOLVAY CHEMICALS FOR THE PAPER INDUSTRY

Caustic Soda • Hydrogen Peroxide

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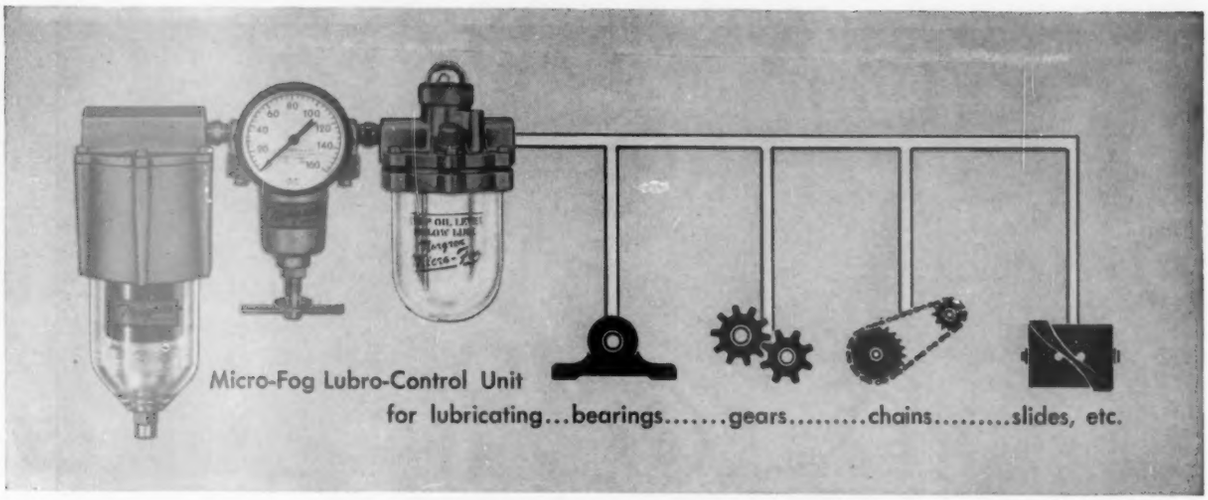
Allied Chemical

SOLVAY PROCESS DIVISION

61 Broadway, New York 6, N.Y.

Branch Sales Offices: Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston • New Orleans New York • Philadelphia • Pittsburgh • St. Louis • San Francisco • Syracuse



Norgren
MICRO-FOG LUBRICATION

Automatically lubricates every bearing surface on a machine

About 10 years ago, a new type of oil fog lubrication, called Micro-Fog was marketed by the C. A. Norgren Co. More and more machine tools are being completely lubricated with Micro-Fog—all bearings, gears, chains, slides, ways.

With any method of lubrication, the only oil that actually lubricates is the thin film that separates the bearing surfaces. Any additional lubricant is a waste and may even be harmful, causing overheating through fluid friction.

An air-borne fog of extremely small oil particles is created by a Norgren Micro-Fog Unit. This Norgren Micro-Fog can be conveyed long distances through low pressure pipelines directly to the bearing surfaces.

Micro-Fog provides thorough lubrication

At the bearing surfaces a nozzle-like fitting, called a reclassifier, causes the small dry oil particles to combine into larger wet particles. These impinge upon the bearing surfaces and cover them thoroughly and continuously with a protective film of oil.

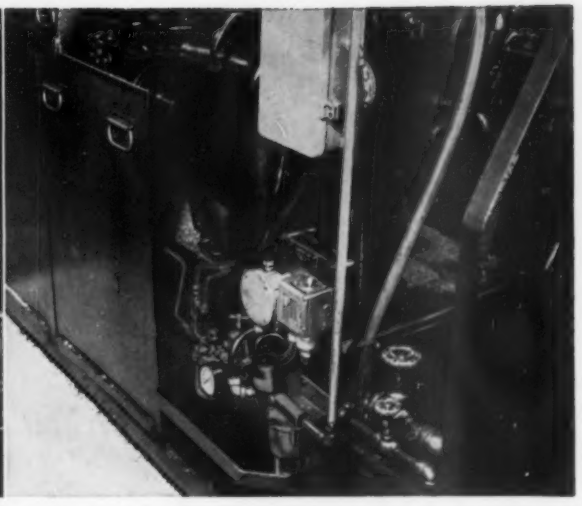
A Norgren Micro-Fog Lubro-Control Unit is a combination of three Norgren Units—an air line filter to remove the compressed air contaminants, a pressure regulator to accurately control pressure and a Micro-Fog Lubricator.

Norgren Lubro-Control Units are adjustable to deliver automatically just the right amount of Micro-Fog to provide continuous lubrication.

A few of the benefits provided by Micro-Fog:

Longer bearing life. Reduced downtime, maintenance and bearing replacement costs. Lower bearing temperatures. Less lubricant used—lower lubricant costs. Centralized lubrication, eliminating time-consuming hit and miss methods. No excess of lubricant—minimum product contamination and easier housekeeping.

Today, Micro-Fog Lubro-Control Units are operating successfully on practically all types of equipment. These applications range from high-speed precision grinders, running at 450,000 rpm, to huge rolling mill bearings on shafts as large as 34" in diameter and turning at relatively slow speeds.

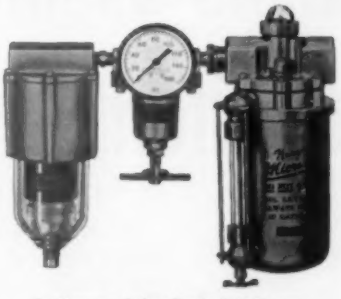


The 150 ball bearings and 70 spur gears on this machine are lubricated by a single Norgren Micro-Fog Lubro-Control Unit. Results: 1. Bearing and gear box seals eliminated. 2. Oil leakage of lubrication system eliminated and safer floor conditions around machine. 3. Oil usage greatly reduced.

With Norgren Micro-Fog, ½ pint of oil per day does a better job of lubrication than the 15 gallons of oil used per day with the previous circulating system. On this automatic screw machine, the Norgren Micro-Fog Unit lubricates sleeve bearings, anti-friction bearings, slide blocks, guides, chucking mechanism and gears.

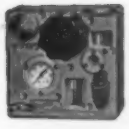
Wide selection of Norgren Units meets most machine lubrication needs . . .

Small, compact units for use where space is tight.



A Norgren Lubro-Control Unit can be made up of any combination of Norgren filter, regulator, lubricator.

A solenoid valve for starting and stopping lubrication as machine is turned on and off can be incorporated as part of a Lubro-Control Unit.



This Lubro-Control Unit is small, compact and complete with filter, regulator and lubricator. It measures only $6\frac{1}{32}$" x $6\frac{1}{32}$" x $5\frac{3}{16}$".

Compact and complete, this Norgren Unit includes automatic alarm controls that safeguard the machine against lubrication failure.

This cabinet unit can be entirely enclosed and locked. It is compact and complete and is equipped with automatic alarm controls.

The above is only a partial listing of the complete Norgren line. For complete information on the large selection of Norgren Micro-Fog Lubro-Control Units available, WRITE FOR DESCRIPTIVE LITERATURE

FOUNDED 1926

C. A. NORGREN CO.

SO. ELATI STREET ENGLEWOOD, COLORADO

1602

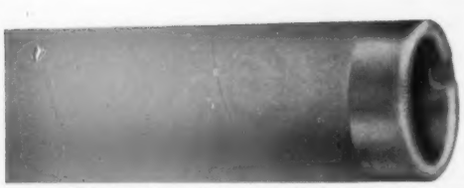
GET more FOR YOUR core DOLLAR....

Sonoco's coast to coast plant locations assure dependable supply and uniform quality!

No matter where you are located, one of SONOCO's plants is nearby offering a dependable supply of economical, uniform quality cores. SONOCO's 60 years' experience, a completely integrated manufacturing operation and continuous research make these advantages possible.

SONOCO cores are made to exacting torque and crush strength specifications. Production is under rigid control from raw material to the finished core. Non-returnable cores are available in all sizes. Returnable cores, with or without famous SONOCO metal ends, are made in all standard sizes. SONOCO can also supply a complete line of metal end core machinery and core cutters.

Regardless of your core needs, you'll get more for your core dollar from SONOCO in service, quality and economy. Call or write today!



SONOCO

Paper Mill Cores

SONOCO PRODUCTS COMPANY 1104

Main Office—Hartsville, S. C. • Mystic, Conn. • Akron, Ind. • Lowell, Mass. • Holyoke, Mass. • Phillipsburg, N. J. • Longview, Texas • Philadelphia, Pa. • La Puente, Cal. • Fremont, Cal. • Atlanta, Ga. • Brantford, Ont. • Granby, Quebec • Mexico, D. F.

PENNSALT CONTINUOUS HYPOCHLORITE REACTION COLUMN

uniform bleach liquor produced in less space... at less cost than by conventional batch system

To meet the request of the pulp industry for a simple and reliable continuous sodium or calcium hypochlorite preparation system, Pennsalt engineers applied the well known basic principles of batch preparation:

1. The preparation of the alkali prior to chlorination at constantly uniform strength.
2. Reaction column design for rapid and complete mixing and reaction of the chlorine and alkali.
3. Immediate and continuous discard of grit and inert materials removed in the centrifugal clarification of calcium hypochlorite.

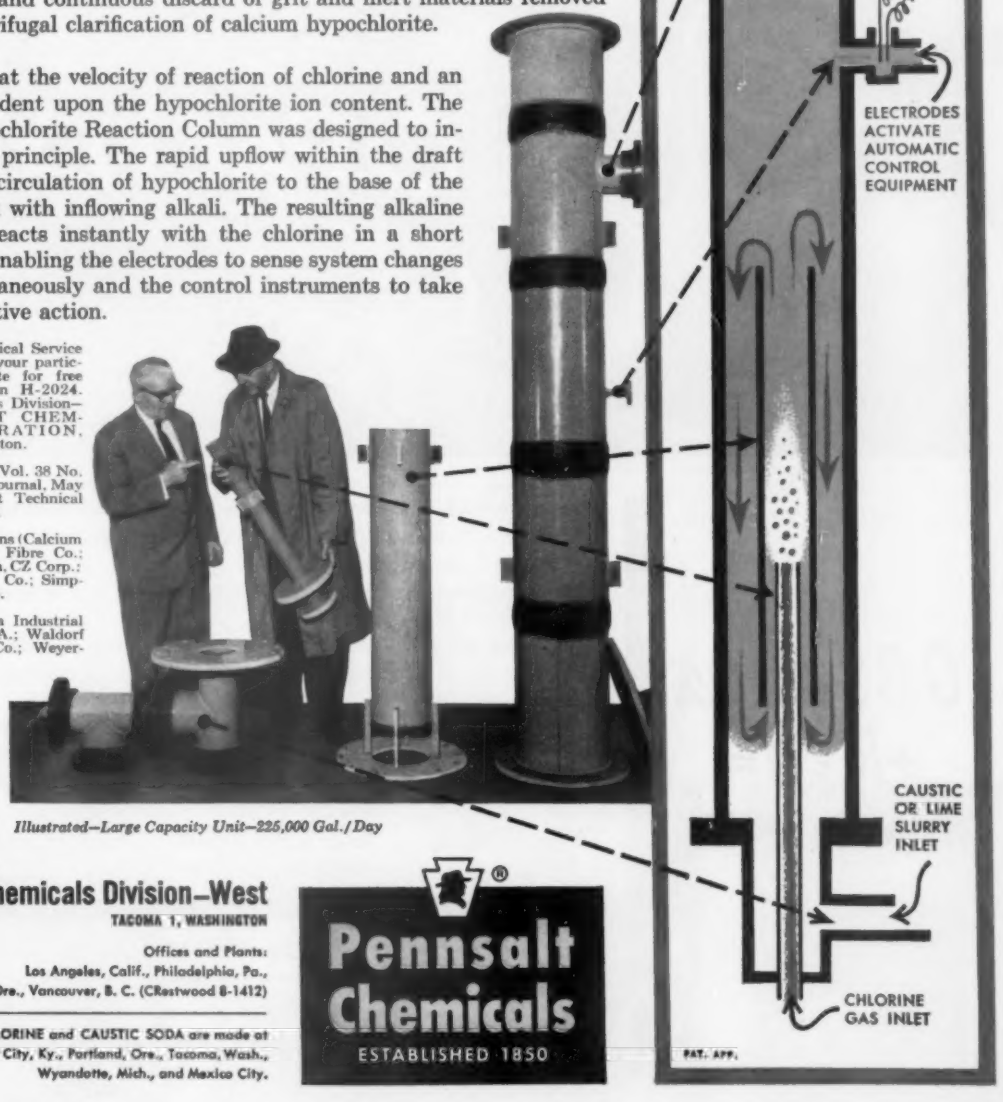
It is known that the velocity of reaction of chlorine and an alkali is dependent upon the hypochlorite ion content. The Pennsalt Hypochlorite Reaction Column was designed to incorporate this principle. The rapid upflow within the draft tube causes recirculation of hypochlorite to the base of the column to mix with inflowing alkali. The resulting alkaline hypochlorite reacts instantly with the chlorine in a short reaction zone enabling the electrodes to sense system changes almost instantaneously and the control instruments to take prompt corrective action.

Ask Pennsalt Technical Service for help in solving your particular problem. Write for free Technical Bulletin H-2024. Industrial Chemicals Division—West, PENNSALT CHEMICALS CORPORATION, Tacoma 1, Washington.

References: TAPPI Vol. 38 No. 10; Paper Trade Journal, May 7, 1956; Pennsalt Technical Brochure No. 21.

Reference Installations (Calcium Base): Longview Fibre Co.; St. Helens Division, CZ Corp.; Publishers' Paper Co.; Simpson-Lee Paper Co.

(Sodium Base): Cia Industrial San Cristobal S. A.; Waldorf Paper Products Co.; Weyerhaeuser Co.



Illustrated—Large Capacity Unit—225,000 Gal./Day

Industrial Chemicals Division—West
TACOMA 1, WASHINGTON

Offices and Plants:
Los Angeles, Calif., Philadelphia, Pa., Portland, Ore., Vancouver, B. C. (CRestwood 8-1412)

PENNSALT CHLORINE and CAUSTIC SODA are made at Calvert City, Ky., Portland, Ore., Tacoma, Wash., Wyandotte, Mich., and Mexico City.

Pennsalt Chemicals
ESTABLISHED 1850

GBS+ClO2
+R&D=
WONDERWHITE

Now, at last, a papermaker's dream come true...

There are a number of pulps which offer high brightness...There are others which offer high opacity.

But now Gaspesia is producing WONDERWHITE: a pulp which features *high brightness and high opacity*.

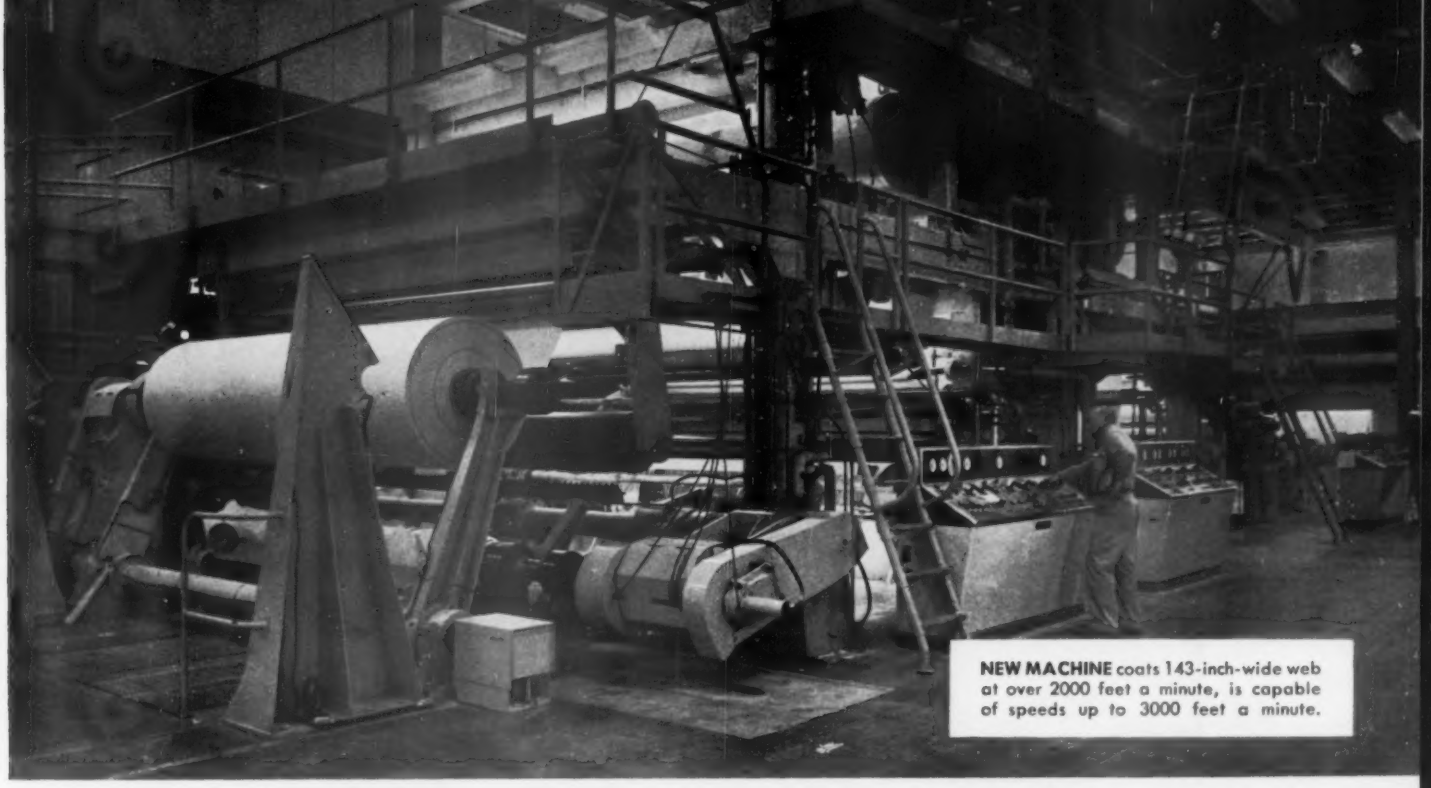
Gaspesia, with its Northern Spruce, has always been known for high opacity pulp. Now, by using Chlorine Dioxide, the highest level of brightness has been achieved—with *no loss in opacity*.

Also, you will find that WONDERWHITE has the forming properties found only in Northern sulphite pulps. Why not order a trial shipment and let WONDERWHITE tell its own story?

GASPESIA SULPHITE COMPANY LTD.
CHANDLER, QUEBEC, CANADA

SOLD BY: **Anglo Paper Products, Ltd.**
2055 Peel Street, Montreal 2, Quebec

SALES REPRESENTATIVE IN THE UNITED STATES:
Northeastern Paper Sales, Inc.
400 Madison Avenue, New York 17, N.Y.



NEW MACHINE coats 143-inch-wide web at over 2000 feet a minute, is capable of speeds up to 3000 feet a minute.

With General Electric Drive System, New Blandin Coater can . . .

SPLICE AT FULL OPERATING SPEED

Running at over 2000 feet a minute, the new off-machine coater at Blandin Paper Company, Grand Rapids, Minnesota, splices without losing a second of production or a foot of maximum quality.

THE MULTIPLE-GENERATOR DRIVE SYSTEM for this unique coater was supplied by General Electric. Working closely with the machine builder, Rice Barton Corporation, and with Blandin's own engineering staff, General Electric designed and built a special drive system which provides the precision control necessary for full-speed splicing.

GENERAL ELECTRIC INSTALLATION ENGINEERS followed up delivery with two months of intensive assistance during erection and assembly, then called in a team of application engineers for a system checkout during the first week of actual operation. Result of all this careful system co-ordination: no coater downtime attributable to drive equipment.

Call your local General Electric Apparatus Sales Office for more information about G.E.'s complete engineering resources, from initial design to final checkout. General Electric Company, Schenectady 5, New York. 655-28

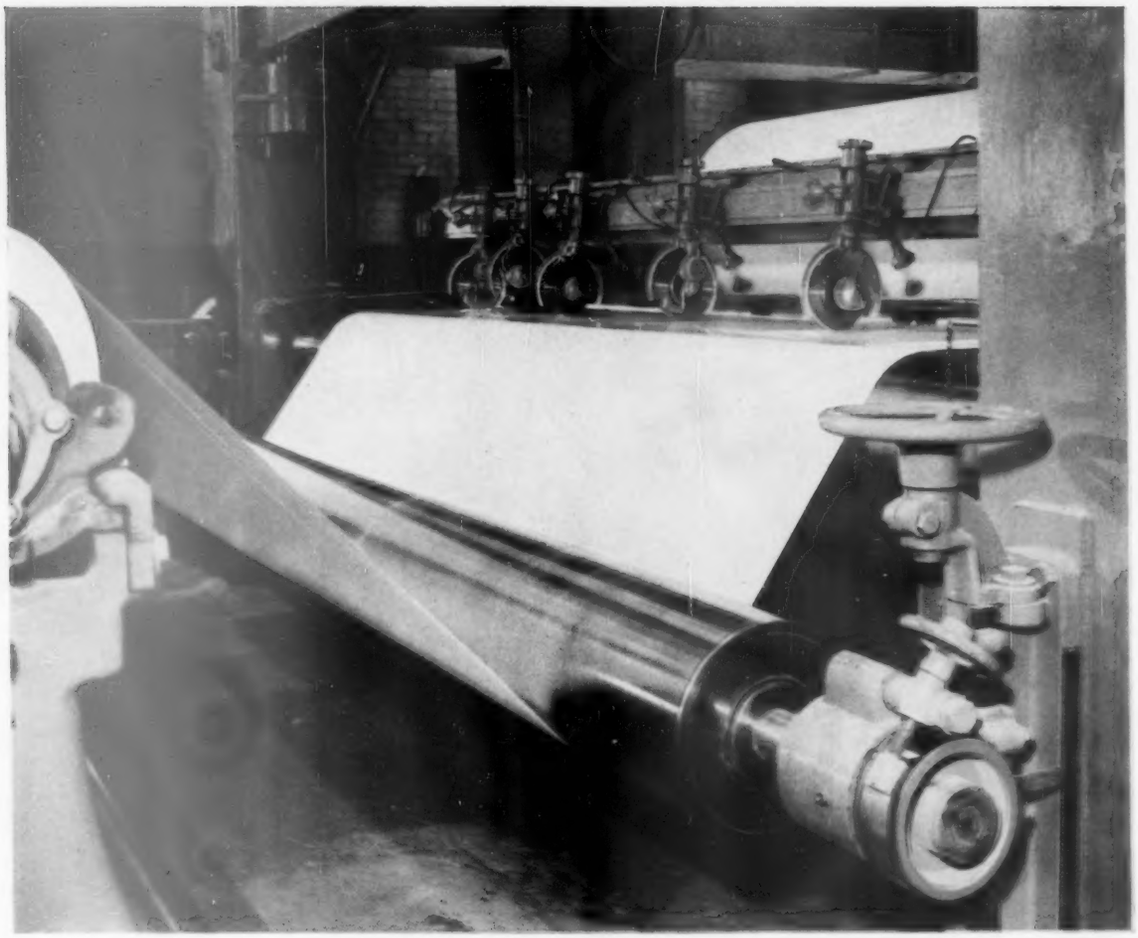
Progress Is Our Most Important Product

GENERAL ELECTRIC

UNWIND SECTION includes primary and secondary roll arms, automatic splicing equipment, paste roll, core-removal conveyor, and guillotine.

G-E MAIN CONTROL PANEL provides automatic sequencing for the unwind splicer and integrates the unwind with the other six sections of the machine.

G-E MOTOR-GENERATOR SET provides d-c power to the individually regulated Kinamatic® sectional drive motors.



S. R. CHRISTENSEN

Oxford Paper Company, Rumford, Maine

Improved slitter arrangement

The slitter arrangement pictured above materially increases slitter life and makes slitter settings simpler and faster. This new slitter design incorporates a preset shear angle between top and bottom slitter, plus other improvements which result in a 200 to 300 per cent increase in slitter life. This new arrangement also insures correct slitter setting, with a 50 per cent reduction in slitter resetting time and less attention from the operator. This arrangement is the result of two years' development and is now standard on all Beloit winders.

FINISHED PRODUCT PROCESSING EQUIPMENT

Winders • Petite Winders • Slitters Supercalenders • Roll Wrappers Roll Lowering Tables • Roll and Shaft Handling Equipment • Conveyors Unwind Stands and Tru-Tension Controls • and other equipment for the paper and allied industries.

BELOIT EASTERN PAPER MACHINERY DOWNINGTOWN, PENN.

Member Beloit Group

BELOIT EASTERN CORPORATION

DOWNINGTOWN, PENNSYLVANIA

Now Cyanamid brings you

accurac* 24

Retention Aid

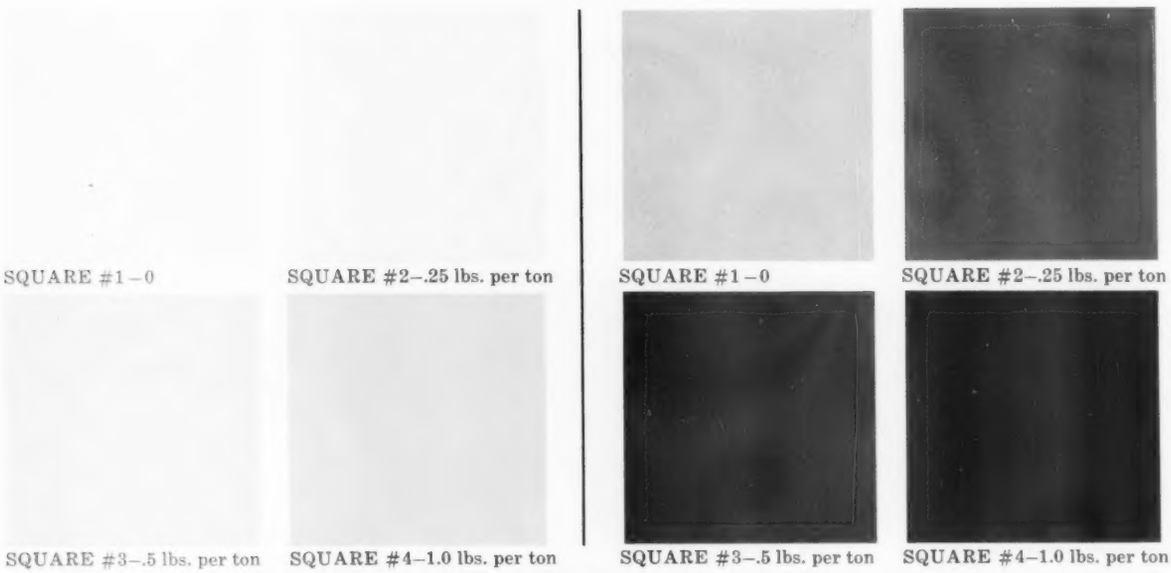
the finest retention aid on the market today†

*TM American Cyanamid Company †Based on controlled evaluations.

here's visual proof of pigment-saving

accurac* 24

Retention Aid


SQUARE #1 – 0
SQUARE #2–.25 lbs. per ton
SQUARE #3–.5 lbs. per ton
SQUARE #4–1.0 lbs. per ton
SQUARE #1 – 0
SQUARE #2–.25 lbs. per ton
SQUARE #3–.5 lbs. per ton
SQUARE #4–1.0 lbs. per ton

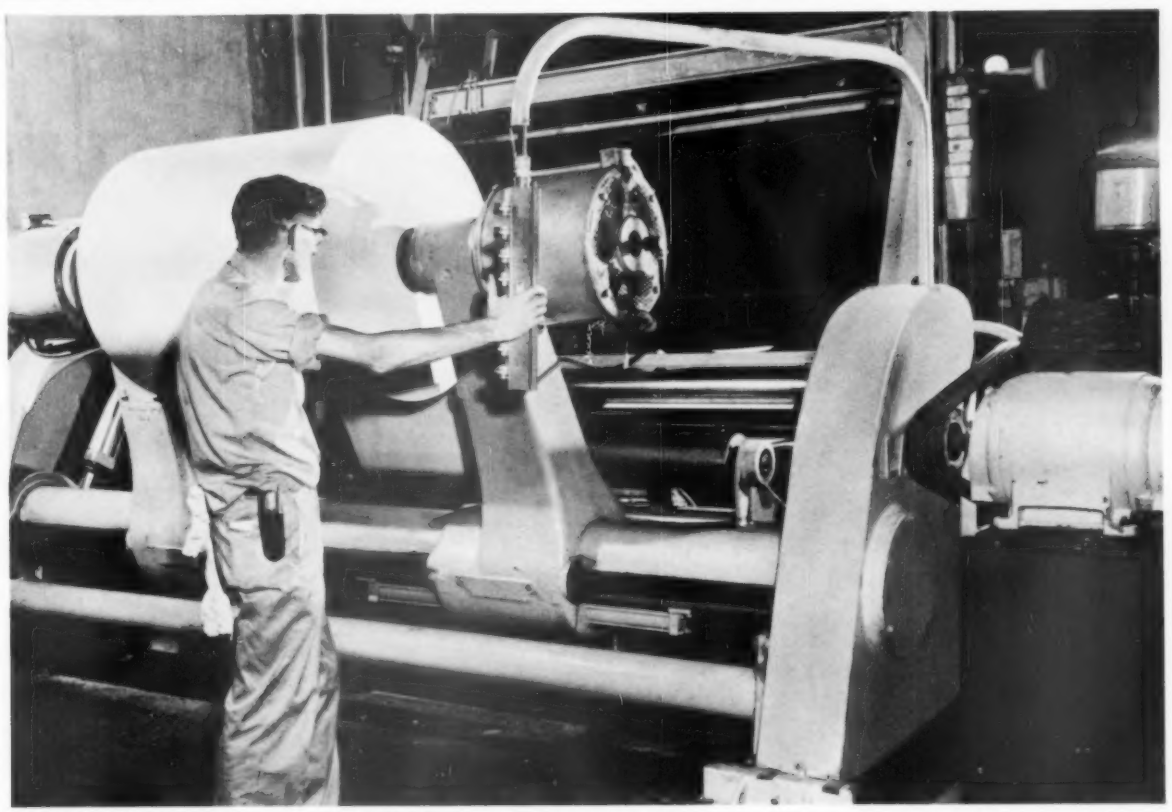
Each block contains equal amounts of blue or yellow pigment. The ACCURAC 24 content varies from zero to 1.0 pounds per ton of paper as indicated. Color specifications may be maintained by adding ACCURAC 24 in appropriate amounts while reducing the amount of pigment added to the stock. Or, additions of ACCURAC 24 to a given amount of pigment will intensify the final color.

Note the advantages of ACCURAC 24! Aids retention of fillers and costly pigments such as TiO_2 and colored pigments. Same color specifications with less pigment added. Retention of fines for improved formation of the sheet. Less fines in white water. Less load on save-alls. Less 2-sidedness in colored paper. Faster machine drainage. ACCURAC 24 is being successfully used in the paper industry to improve the retention of fines and pigments. For full information, send for Cyanamid's data sheet on ACCURAC 24.

CYANAMID

AMERICAN CYANAMID COMPANY • PAPER CHEMICALS DEPARTMENT, 30 Rockefeller Plaza, New York 20, N.Y.

THE Langston Leader
PAPER MILL EDITION
Leadership...by design
SAMUEL M. LANGSTON CO. • CAMDEN 4, N. J.
OCTOBER, 1960 | *Published for the information of paper and board mills* | VOL. 2, NO. 6



PACIFIC NORTHWEST DEBUT. Langston hydraulic shaftless unwind stand at Potlatch Forests, Inc., Lewiston, Idaho, has helped increase rewinder production by as much as 50 percent. Saves manpower, time and waste. No heavy shaft to handle. No cone tightening. No crane needed to lift rolls, just simple pushbutton control of the entire roll loading operation.

On Rewinder at Potlatch Forests

Unwind Stand Helps Improve Roll Quality, Cut Waste In Narrow Slitting and Production of Salvage Rolls

The Lewiston, Idaho, mill of Potlatch Forests, Inc., has been able to increase its rewinder roll production by as much as 50 percent as the result of installation of a new Langston shaftless unwind stand behind a 102-inch rewinder.

In addition, the new installation has improved the quality and efficiency of the company's narrow slitting and salvage roll production.

Previously, the manpower for this operation had been "borrowed" from other mill functions as the opportunity presented itself. To meet customer demands for specially slit rolls, as well as for salvaging of slipped rolls or rolls otherwise damaged from the paper machine winders, the new installation was added.

• • •

The work requirements of the operation would not justify full-time shift operations so improved efficiency was sought *and found* in the shaftless stand.

The rewind-unwind units handle bleached sulphate board for use in the manufacture of milk cartons, paper plates, cups and similar products. Weight of the board ranges up to 300 pounds per 3,000 square feet.

The principal advantage experienced so far is the ease and speed with which the operator can get his rolls ready to rewind. The operator can have a roll ready to rewind in the matter of a minute or so.

With the individual brakes mounted on each arm, control of roll density is improved considerably on the rewinder.

Manual handling of the heavy shafts and cones, previously required to ready a roll for rewind, is no longer necessary, thereby eliminating a tedious, difficult and potentially dangerous part of the operation.

The hydraulic cylinders of the Langston stand provide the power for clamping, a job formerly accomplished by manual cone tightening. The hydraulic cylinders apply higher chucking pressure, insuring against slippage of the roll in the cone. Slippage can result in damage to the core, or to the roll itself if no core is used.

• • •

The rolls are lifted by a quick, gentle hydraulic action, controlled by push button. Parent rolls as small as 14 inches or as large as 60 inches in diam-

(*Continued on next page*)

eter can be picked off the floor.

Lateral adjustment for aligning a new roll with rewinder slitters also is accomplished quickly through remote control.

Even if rolls as narrow as 10 inches or 12 inches are on the unwind stand, rewinder speed need not be reduced as is required with shaft type unwinds where shaft deflection is aggravated by out-of-rounds rolls.

The n[illegible]esult is higher average operating sp[illegible]s regardless of parent roll width or condition.

• • •

To accommodate the wide range of board grades it is important to have a variety of cones. For lighter grades a small diameter cone is needed to get as much board as possible on a roll. On heavy grades very much larger cones are used to prevent curl at the center of a roll.

The Langston shaftless stand at Potlatch has seven different size cones ranging from 4 to 16 inches in diameter. These are easily and quickly changed by means of a single bolt located at the center of each cone.

Perhaps *your* rewinder efficiency can also be improved. If so, we would like to discuss it with you. Write to Samuel M. Langston Company, Camden 4, N.J.

Rolls with collapsed cores become very difficult and sometimes impossible to put a shaft through for standard shaft type unwind stands. This sometimes means that perfectly good paper has to be sent back to the beaters for reclaiming.

• • •

With the tremendous squeeze pressure available on the Langston hydraulic shaftless stand, the cone chucks can be forced into these badly collapsed core openings, resulting in considerable increases in board salvage.

The Potlatch stand is equipped with Langston pneumatic side register control. This enables the operator to rewind badly slipped—telescoped—rolls without the need for taking trim.

The sensing unit is a continuously self-cleaning unit, which delivers its signal to a sensitive pneumatic diaphragm. The signal is then converted to actuate a hydraulic cylinder mounted between and attached to one of the two side frames.

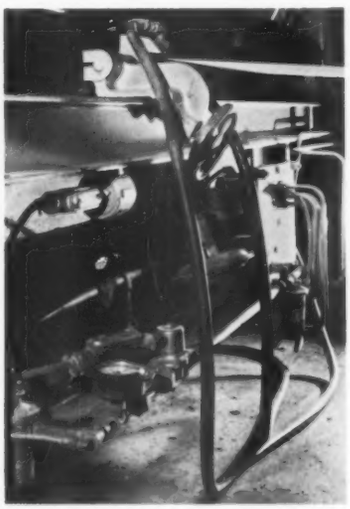
• • •

When the cylinder is actuated the stand and parent roll are moved laterally as a unit on ladder type bearings mounted under the frames. The design is very simple and effective.

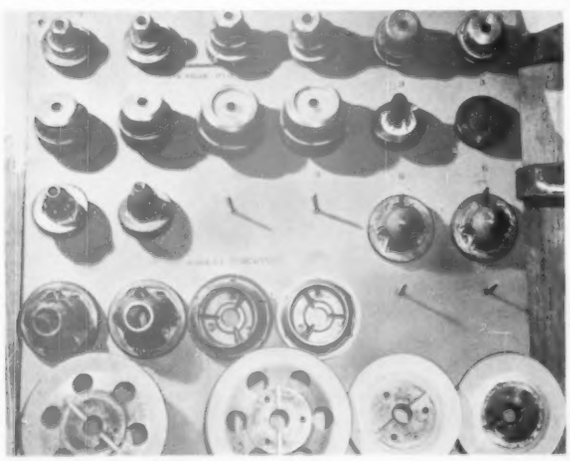
One benefit has been realized with installation of the shaftless unwind stand that had not been anticipated.

Because many paper grades are in direct contact with food, it was necessary for the rewinder operator to wash the grease and paper dust from his hands each time he shafted a roll. Since the shaftless stand does not require manhandling the rolls, considerable time-saving in this respect also has been realized.

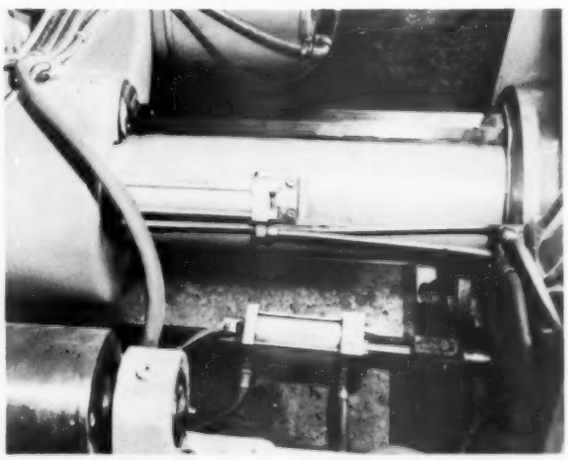
ACCESSIBLE ARRANGEMENT makes it easy for operator to handle splices or indicate faults. Sensing head of side register control is in foreground.



CLOSEUP view of air-sensing mechanism.



ASSORTED CONES ON RACK accommodate wide range of board weights.



HYDRAULIC CYLINDER for automatic side register control.

Professor Pulp takes time out...

Puzzled?

Not really, when you have Howard Smith's wide range of quality pulps.

Howard Smith
PAPER MILLS LIMITED
PULP SALES DEPARTMENT
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MAKERS OF CANADA'S FINEST PULPS AND PAPERS

Progressive paper companies rely on these quality pulps:

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Bleached Soda Pulp

STORMONT
Bleached Sulphite

DONNACONA
Unbleached Sulphite

WINDSOR
Unbleached Kraft

US RUBBER CONVEYOR BELTS

Note the perfection of training and troughing shown in this photograph.

Marathon-Southern's new mill is 100% equipped with "U.S." Conveyor Belts

United States Rubber literally has the run of the mill in the Marathon-Southern Corp.* mammoth unit at Naheola, Alabama. "U.S." Conveyor Belts are used as follows:

- *Two U.S. Matchless® Conveyor Belts for log sorting.
- *Two U.S. Matchless Conveyor Belts for use as chipper feed log belts.
- *Six U.S. Oil-resistant Conveyor Belts (two running from chip conveyors to screens, two running from chip conveyors to silos and two more running from silos to chip conveyors).
- *One U.S. Oil-resistant Conveyor Belt used as a digester feed chip conveyor.
- *One Oil-resistant belt used as screen rejects conveyor.
- *One Oil-resistant belt used as purchased chip conveyor.
- *U.S. Giant Conveyor Belt used as refuse conveyor to boiler.
- *Special Tan Natural Rubber Covered Belt used as stock conveyor from washer.
- *Special Tan Natural Rubber Covered Belt used as stock conveyor to MD storage.
- *U.S. Giant Conveyor Belt carrying coal to crusher house.
- *U.S. Giant Conveyor Coal Stacker Belt.
- *U.S. Giant Conveyor Belt carrying coal from crusher house to boiler.
- *U.S. Giant Conveyor Belt used on coal reclaim feeder.

Marathon-Southern's selection of "U.S." Belts *exclusively* is due to their long-established record of low-cost haulage, durability and freedom from maintenance. This is another mill in which "U.S." demonstrates the kind of performance that has made it the foremost authority in belting.

The most comprehensive belting engineering information is available through your "U.S." Distributor. It will pay you to check with him.

US RUBBER Mechanical Goods Division

United States Rubber

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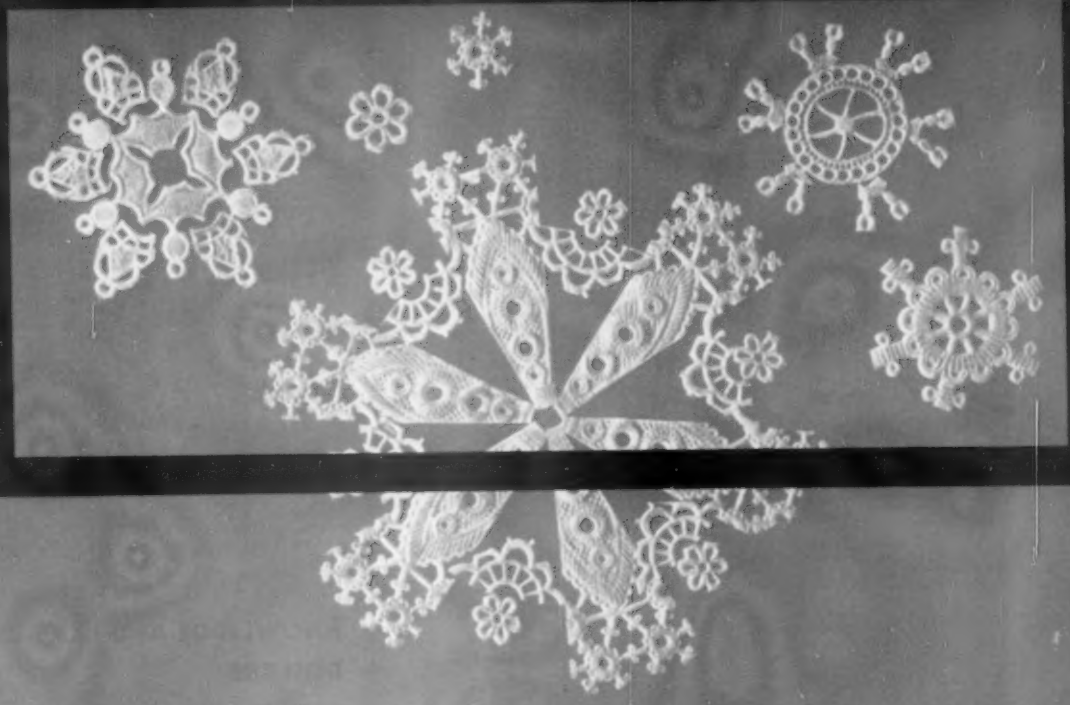

NEW ABITIBI "SNOWBRITE" PULP IS STRONGER... BRIGHTER... MORE OPAQUE... MORE PRINTABLE...WATERMARKS BETTER...IS TAILORED TO YOUR REQUIREMENTS.

"SnowBrite" pulp is now being manufactured at Abitibi's new chlorine dioxide bleached sulphite mill at Smooth Rock Falls, Ontario. Newly designed equipment produces this superior sulphite pulp of uniform quality. Abitibi "SnowBrite" is distributed exclusively in the United States by Mead Pulp Sales, Inc. For samples and further information, contact the Mead Pulp Sales Office nearest you.

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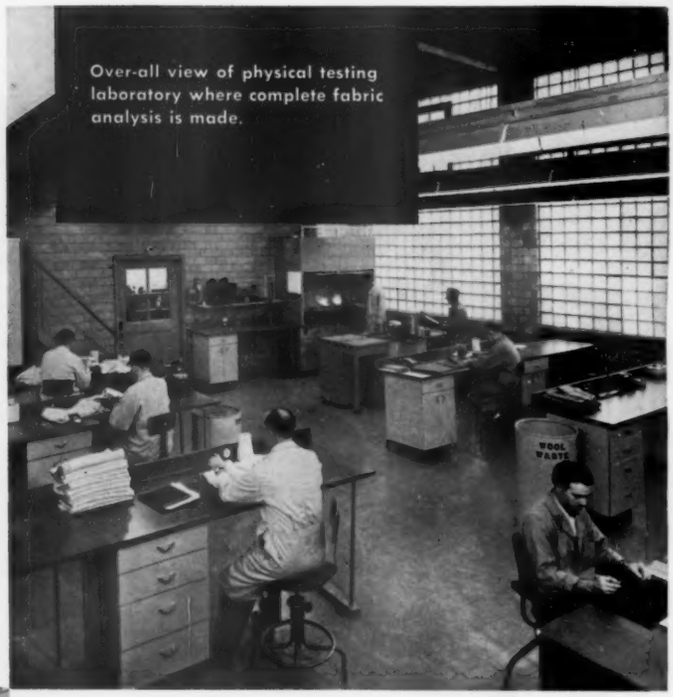
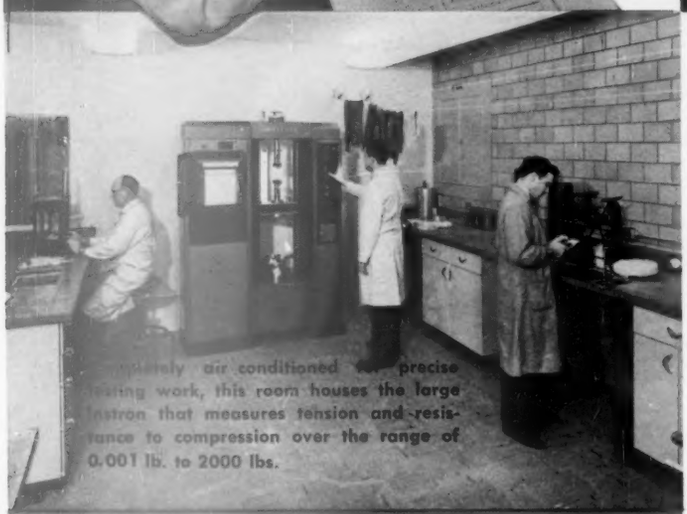
Distributors of Bleached and Unbleached, Chemical and Mechanical Wood Pulp; Fiberglass Paper Machine Hoods and Allied Equipment • 230 Park Avenue, New York 17 • 20 North Wacker Drive, Chicago 6 • 118 West First Street, Dayton 2 • 1504 Sherbrooke Street, West, Montreal, Canada.

MEAD
pulp

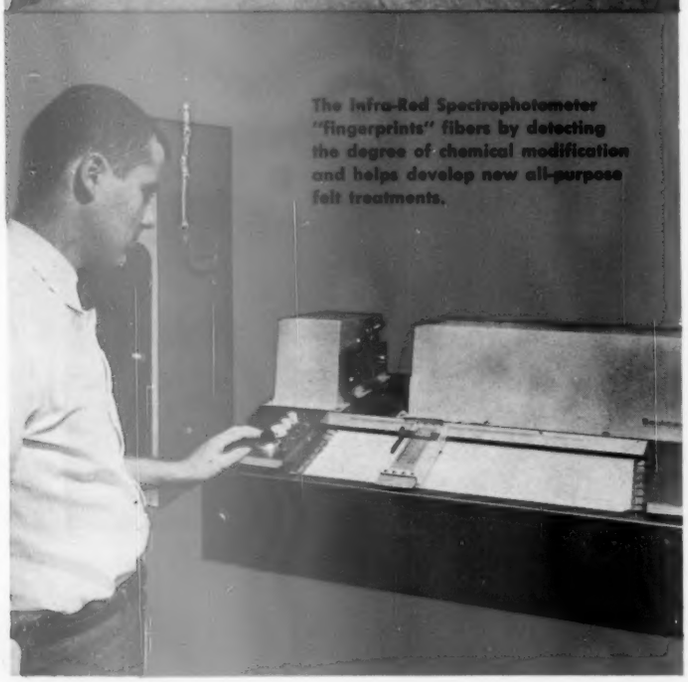
Refractometer checks laboratory prepared chemicals used in developing new felt treatments.



Over-all view of physical testing laboratory where complete fabric analysis is made.



...pletely air conditioned ... precise ...sting work, this room houses the large ...stron that measures tension and resistance to compression over the range of 0.001 lb. to 2000 lbs.



The Infra-Red Spectrophotometer "fingerprints" fibers by detecting the degree of chemical modification and helps develop new all-purpose felt treatments.

Science center of the felt industry

HERE HUYCK TAKES

TRAINED SCIENTISTS AND ENGINEERS
+ LATEST EQUIPMENT AND FACILITIES
+ KNOWLEDGE AND EXPERIENCE
+ DOLLARS
AND MAKES PROGRESS

This is the basic equation for success. The millions of dollars spent each year at this Science Center results in felts that fit better, start-up faster and give longer, more trouble-free life. All-purpose 4-D Treatment and HUYVEL Process for controlling hair shedding and marking are but two of the continuing Huyck developments that mean better felt performance now and in the future.

The instruments, facilities and scientists pictured are in addition to the many devoted exclusively to customer service. They represent Huyck's investment in feltmaking progress that is unsurpassed in the felt industry. You are invited to view these pictures carefully and ask your Huyck Sales and Service Engineers how each device and service can improve your felt operations.

The Vapor Fractometer, the modern tool for performing chromatographic analyses, accurately seeks out types of felt damage.

Fiber diameters are measured with this projection microscope to assure the use of uniform diameter wools.

Felt Wear Tester simulates actual paper machine conditions and serves as pilot plant for testing new felt developments.

One of two Instrons, sensitive instruments used to measure the strength and resilience of felts, yarns and individual fibers.

HUYCK FELTS

Huyck Felt Co.,
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Division of Huyck Corporation.
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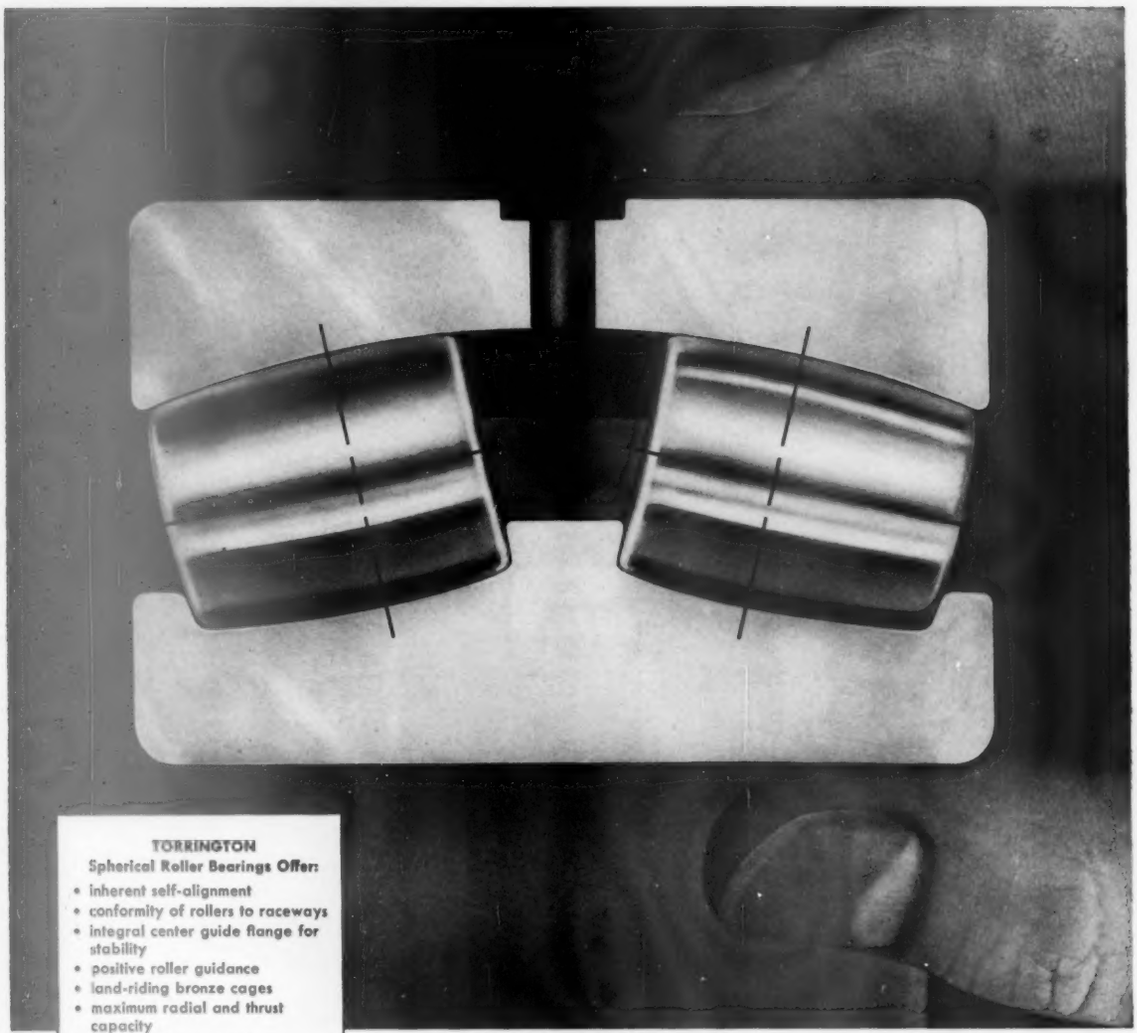
NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870



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Spherical Roller Bearings Offer:

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- integral center guide flange for stability
- positive roller guidance
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- maximum radial and thrust capacity
- controlled internal clearance
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- long, dependable service life

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The asymmetrical shape of each roller in Torrington Spherical Roller Bearings contributes directly to operating stability and long service life.

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The roller shape also approaches that of a tapered roller. Lines extended from the roller-to-race contact zone converge at the roller and bearing axes. This approach to true conical rolling action further assures stability.

These are two more reasons why Torrington Spherical Roller Bearings operate cooler, quieter and with greater stability. For the ultimate in bearing performance and service life, always specify *Torrington* Spherical Roller Bearings. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

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Every Basic Type of Anti-friction Bearing

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

LOCKS 'EM IN OR OUT -LONGER

NEW LATEX FOR COATING

RESYN® 3600

POLYVINYLIDENE CHLORIDE

RESYN 3600 is a water dispersed polyvinylidene chloride that promises a revolution in protective coatings. For the first time, it combines exceptional barrier properties with simple low cost application by high speed coating machines or spraying. It offers important new advantages:

MOISTURE—Moisture vapor transmission is 2½ to 5 times lower than that of polyethylene. **ODORS**—Resistance to transmission of common gases 1000-2000 times greater than polyethylene. **CHEMICALS**—Almost complete non-reactivity to concentrated acids, solvents, alkalies and other corrosive materials. Grease and oil penetration is nil. Fire retardancy is excellent.

RESYN 3600 can be coated on paper, paperboard, plastic and other substrates. It also may be applied to fibers. It is of interest to a broad range of industries, including food and other types of packaging, converting, chemical, and textile.

Experimental lots of RESYN 3600 are now available. A 14 million lb. plant will be on stream this fall. Write for information.

National RESINS

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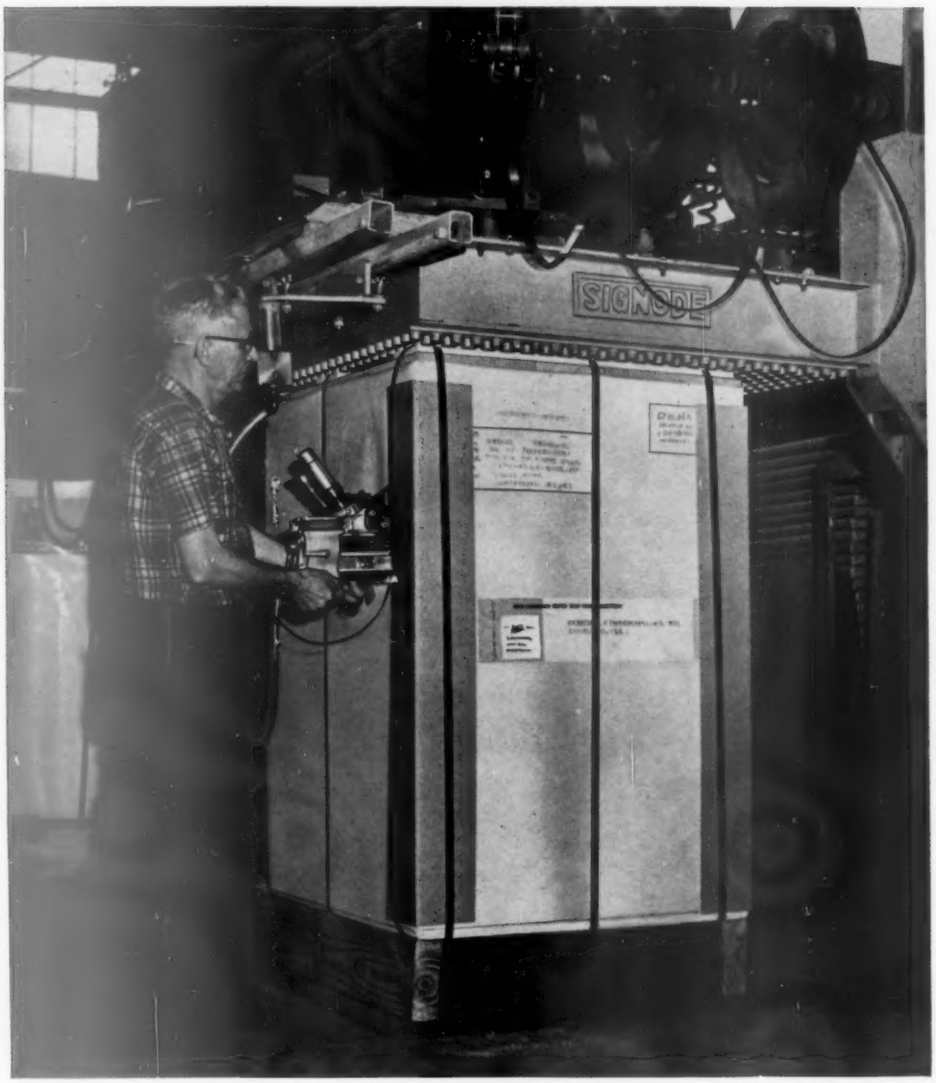
And All Principal Cities in the United States, Canada, England and Mexico



New Signode Compression Strapping Station

This skid of paper is being strapped on a Signode CS20-1 press, using the latest Signode methods. It will arrive at destination in top condition. Paper slippage in transit will be at an absolute minimum—85% less on the average than with other methods. The receiver will get more usable sheets of paper in every skid. He can use the paper directly from the skid without restacking. This mill has improved its product—yet reduced its costs per skid for time and materials.

Write today for all the facts about Signode strapping presses and tools for the paper industry... and for the facts about the money-saving advantages of strapping the Signode way.

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First in steel strapping

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they are all talking about—
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Synthetic Reinforced Cotton Dryer Felt
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Types 1166-S, 1164-S, 1464-S
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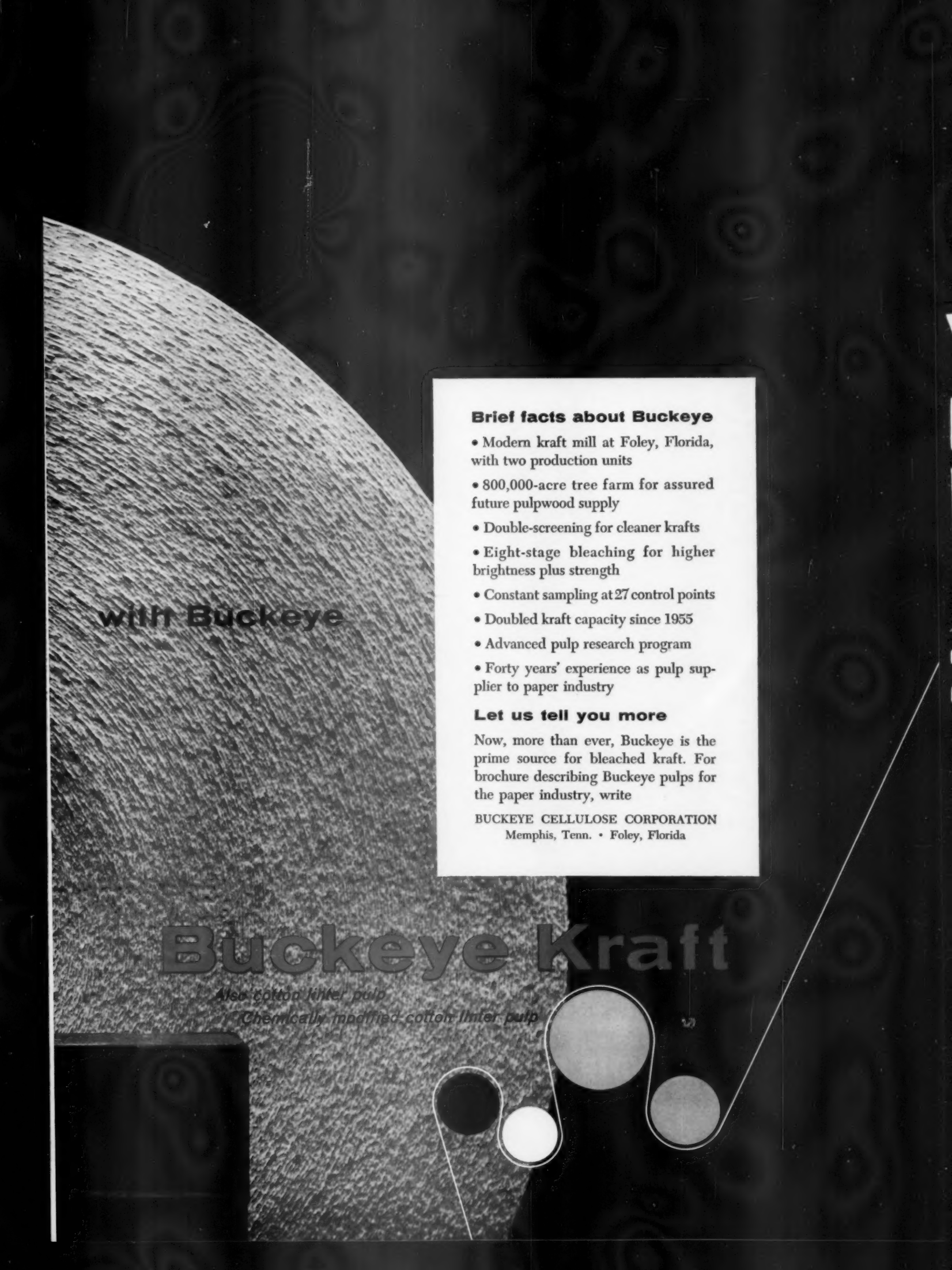
Market pulp
is our business
...and it can pay you to do business



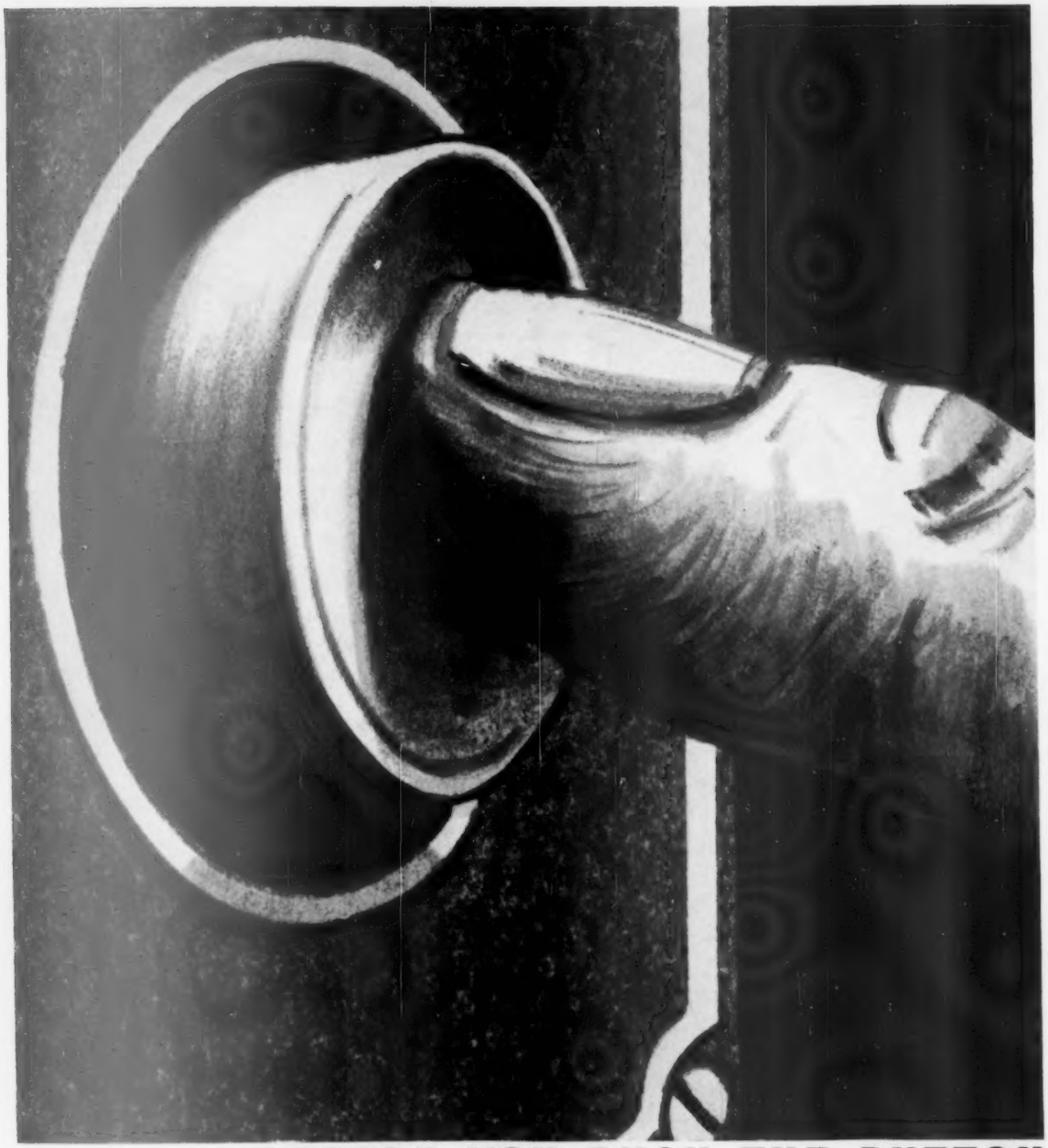
Brief facts about Buckeye

- Modern kraft mill at Foley, Florida, with two production units
- 800,000-acre tree farm for assured future pulpwood supply
- Double-screening for cleaner krafts
- Eight-stage bleaching for higher brightness plus strength
- Constant sampling at 27 control points
- Doubled kraft capacity since 1955
- Advanced pulp research program
- Forty years' experience as pulp supplier to paper industry

Let us tell you more

Now, more than ever, Buckeye is the prime source for bleached kraft. For brochure describing Buckeye pulps for the paper industry, write

BUCKEYE CELLULOSE CORPORATION
Memphis, Tenn. • Foley, Florida



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WHEN YOU HAVE A PROBLEM WITH PULP CHEMICALS, WE CAN HELP. ON MILL START-UPS, FOR EXAMPLE.

Our service engineers can help on the chemical end from the time you plan your bleaching facilities to the day you push the buttons and go on stream.

We can advise on materials of construction, storage, handling methods, process flow, and the like. Just ask.

PULP BLEACHING BULLETIN brings together compactly all the classical methods as well as the recent innovations in pulp bleaching. Fully referenced to the technical literature. Write for a copy.

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HOOKER CHEMICALS PLASTICS

HOW YARWAY BLOW-VALVES REDUCE DIGESTER OPERATING COSTS

Faster blow

Valve by valve comparisons show Yarway Seatless have up to 100% greater discharge area than some other digester blow valves of the same nominal pipe size. Result—faster discharge, lower pressure drop.

Cleaner blow

Steam purging is unnecessary since Yarway's seatless hollow-sliding-plunger design eliminates all pockets where wood chips or tramp metal can hang up.

Tighter seal

Yarway's tight seal (spring-loaded packing rings above and below inlet port) prevents loss of cooking liquor and insures thorough cooking of pulp.

It all adds up to reduced blowing time, more cooks per day, greater output of pulp—
LOWER DIGESTER OPERATING COSTS.

Send for free bulletin on the selection, operation and maintenance of digester blow-valves.

Yarway Blow-Valve in open position. Note full, free discharge.

REMOTE-CONTROLLED, ELECTRIC OR HYDRAULIC OPERATION
Yarway Digester Blow-Valves may be controlled from any remote point. Choice of motor-unit or hydraulic-cylinder operation.

YARNALL-WARING COMPANY
100 Mermaid Ave., Philadelphia 18, Pa.
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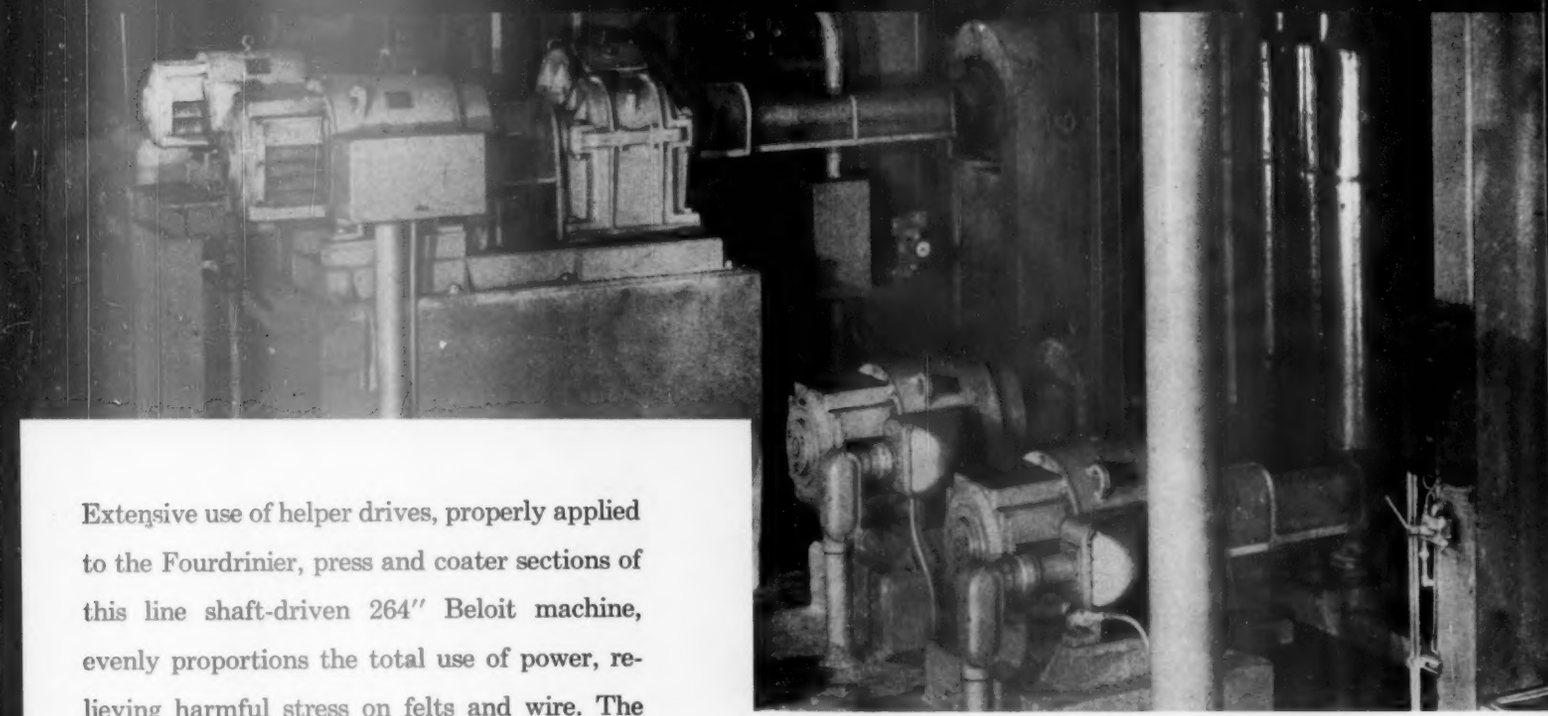
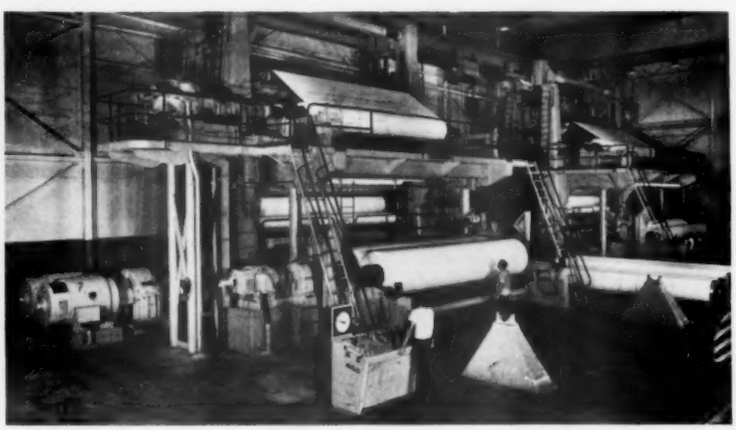
YARWAY DIGESTER BLOW-VALVES

NEW ST. FRANCISVILLE MILL USES RELIANCE HELPER



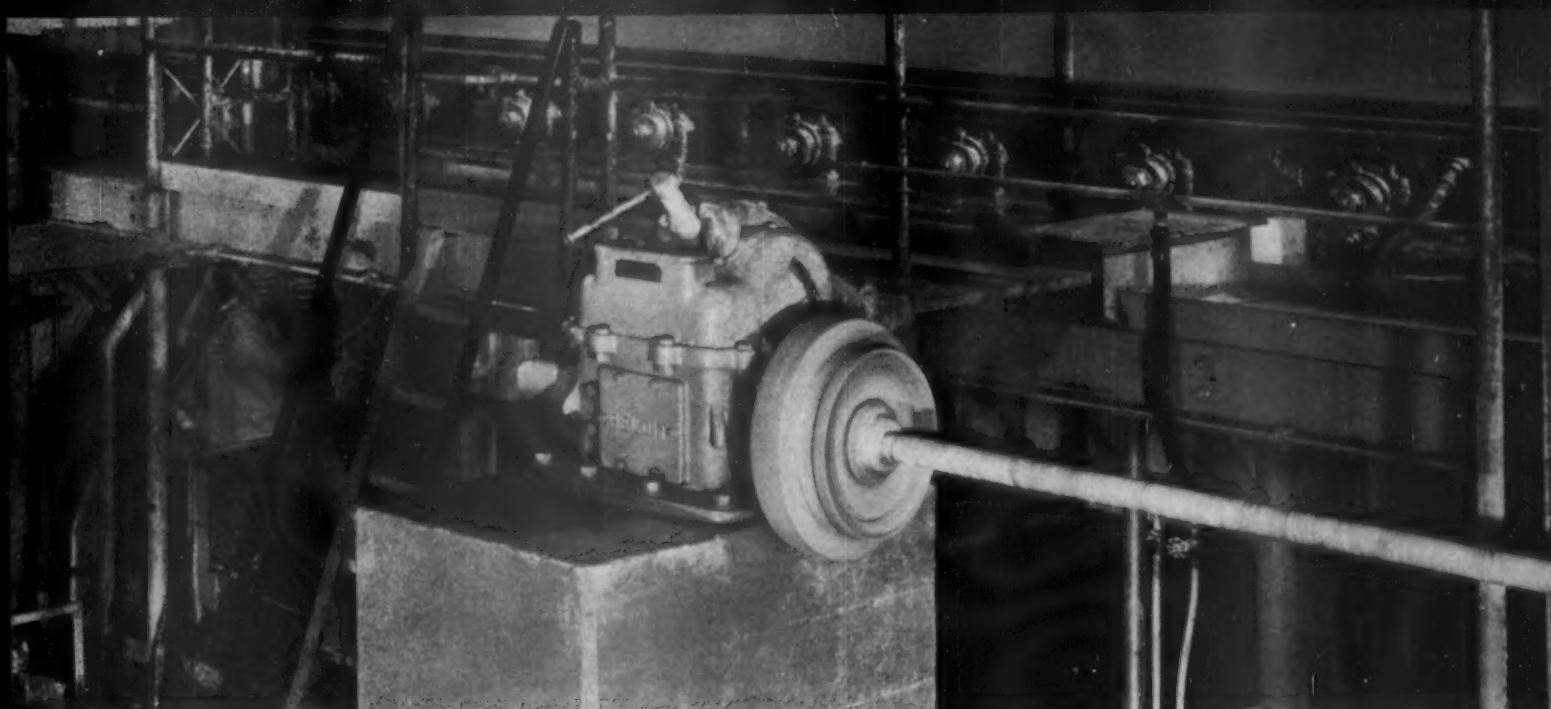
Extensive use of helper drives, properly applied to the Fourdrinier, press and coater sections of this line shaft-driven 264″ Beloit machine, evenly proportions the total use of power, relieving harmful stress on felts and wire. The key is in the balancing—the precise regulation—of helper drive torque against mechanical torque. Continuous maintenance of this relationship at 2500 feet per minute, is vital if maximum wire and felt life is to be realized.

The helper motors are powered by line shaft driven generators. VSMR mill-type regulators continuously maintain preset relationship of total electrical to total mechanical power input, regardless of changing load demands. The end result is smooth, fast, coordinated machine performance, which produces uniform quality magazine stock. Helper drives regulated in this manner also have smooth acceleration characteristics, relieving the mechanical equipment of excessive accelerating loads.

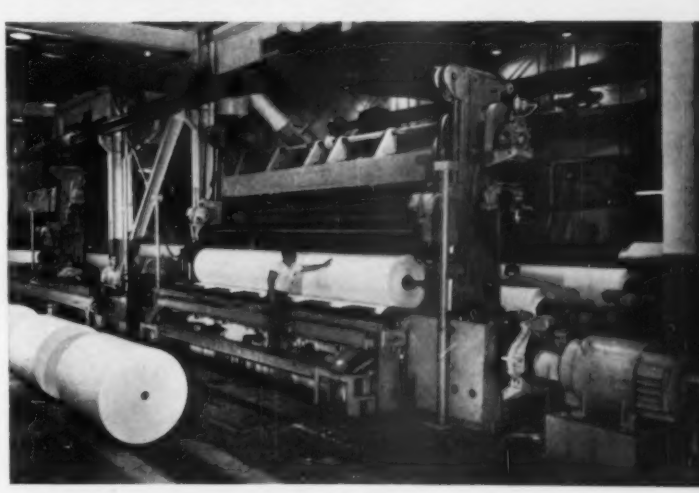


Two Reliance driven Appleton supercalenders handle the output of the paper machine. Motors are synchronized to keep paper flowing smoothly at top speeds of 2500 fpm. Accurate drive regulation maintains exact, pre-set speeds . . . and uniform tension. The same precise tension is maintained during acceleration and deceleration of the drive system.

DRIVES TO PROLONG WIRE AND FELT LIFE...



The Cameron winders, also Reliance driven and controlled, complete the production operation. The 250" rolls are rewound and slit for shipment at 5000 fpm. VSR regulators accurately hold winding speeds and also smoothly change the drive to thread speeds for passing splices.



Reliance systems engineering gives you what you want, when and where you want it.

Your Reliance Sales Engineer, who has all the facts, can help you plan and apply the type of engineered drive most suitable to your requirements. Call him, or if you prefer, write to us direct.

L-1681

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

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uty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.

Performance makes the world of difference

Fig. 2310—Large Flush Bottom Tank Valve for 150 pounds W.P. Disc opens into valve. Also made with disc opening into tank—Fig. 2309.

Fig. 2193—Large Ni-resist Gate Valve for 200 pounds W.O.G. Small size gate and swing check valves in Ni-resist are also available.

Fig. 1563G—Steel Lubricated Plug Valve. ASA 150 pounds. Bolted gland type. Worm gear operated, approximately 100% flow area.

Powell . . . world's largest family of valves

Here are a few of the many Powell Valves which, because of their proven resistance to corrosion, erosion, heat and wear, are especially adapted and recommended for controlling the flow of acids, alkalies, organic solvents and gases as well as for other pulp and paper mill services. They are available in carefully selected alloys to effectively handle every fluid used in the paper making industry.

Also—Powell makes Digester Valves—on special order only—for introducing wood chips into the digester, and for handling the flow of the digested pulp from the digester. For the full, interesting facts about these as well as the complete line of Powell bronze, iron, steel and corrosion-resistant valves, contact your nearby Powell Valve Distributor or write directly to us for illustrated literature.

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The best combination is.

GLOBE® *dextrines and* **FOXHEAD®** *starch*

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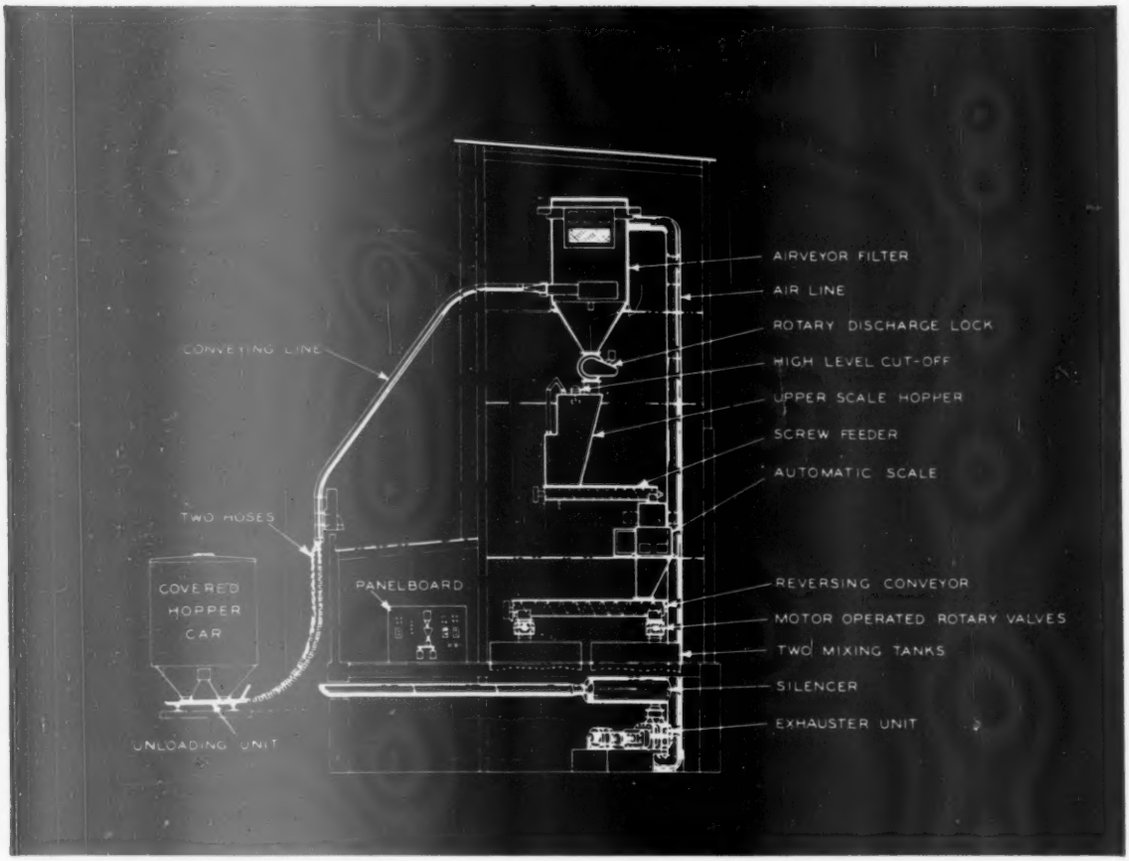

Fuller conveying system helps paper mill cut clay handling time 65%

At New York & Pennsylvania Company's Johnsonburg, Pa., paper mill a new completely automatic clay slip preparation tower speeds production. New unloading equipment has a capacity of 25 tons per hour. This is in contrast with the old manual method in which 6 men worked 5 hours to unload 30 tons of bag clay. How did New York & Penn do it? With a pneumatic conveying system designed and built by the Fuller Company.

Clay is delivered by railway car. Each car holds 50 tons of clay which drops by gravity through outlets directly into the unloading unit then into the conveying system. This consists of two 5-in. flexible hoses connecting into a main 8-in. conveying line. Clay is conveyed through a Fuller Airveyor® system to an Airveyor filter on the top floor of the building. From the filter, the clay is discharged into a surge hopper through a totally-enclosed Fuller rotary airlock. A Fuller high-level indicator on the hopper automatically opens a vacuum breaker in the conveying line in the event that clay is unloaded faster than the equipment following the hopper can take it away.

In addition to eliminating a manual operation, the enclosed Fuller system has reduced New York & Penn's clay loss and improved their dust problem. Fuller's wide variety of conveying systems and components can help solve your problems, too. Why not write us today?

1951
A 287

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TRADE MARK

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Subsidiary of General American Transportation Corporation

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....pioneers in harnessing AIR

Conserve water with Lodding Self Cleaning Showers

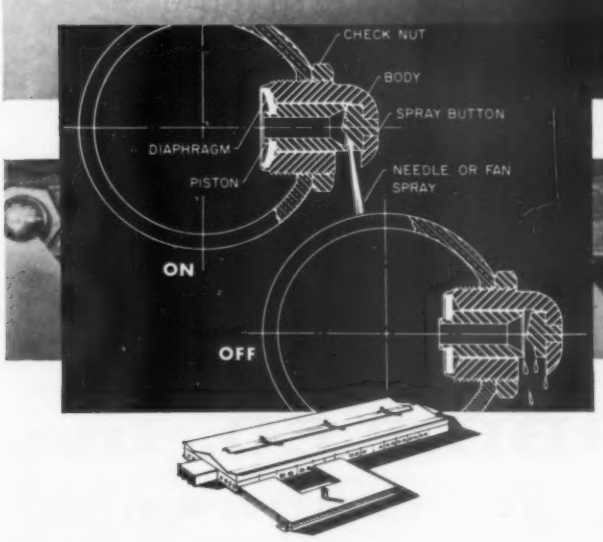
In mill after mill Lodding Showers are conserving water — cutting operating costs — performing effectively.

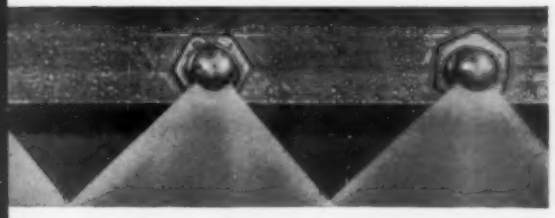
In showers it's the nozzle that counts. And Lodding Nozzles have been engineered to give you the greatest possible showering efficiency, whether your system uses fresh or clarified white water.

Lodding Nozzles are designed with a built-in, sealed piston. In operation, pressure of the water forces the piston against the spray button, which is precision-milled to create the exact spray pattern desired — from an 80° fan to a needle stream.

As particles become lodged in the nozzle, the piston oscillates and automatically frees them. When the water is shut off momentarily the piston retracts. After the water is turned on again there is a brief period before the piston resumes contact with the spray button. During this interval larger particles are flushed from the nozzle.

It will pay you to investigate all the advantages of Lodding Self Cleaning Showers. Lodding, or one of our sales representatives, will be pleased to tell you more about them.





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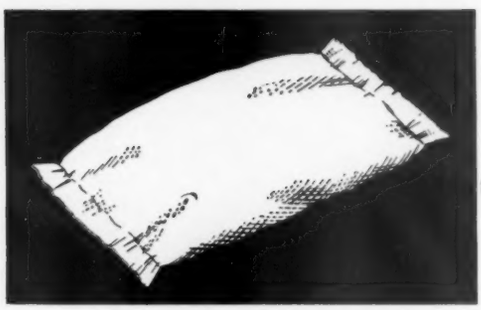
Starch Liquefying Enzyme
in water soluble packets



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of standardized Vanzyme powder
to convert starches
for tub and calender sizing, machine
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Europe's Paper Boom

Over 100 new or rebuilt machines due. Prosperity booms in trade blocs. Business for everyone. Each country will have a healthy paper industry.

By ALBERT W. WILSON
Editor, PULP & PAPER

–Zurich

● The business boom in Europe is showing no signs of weakness this fall. On the contrary, it builds up momentum. And it carries along with it a truly fantastic growth in paper and paperboard demand and consumption.

In my travels these recent weeks through several Continental countries and far north in Sweden and eastward to the Russian-Finnish border, I found company after company pressing eagerly, and even frantically, for more production. I met many company directors who said they are tearing up their most recent building programs and revising them upward.

As of today more than 100 new or rebuilt machines are either being engineered and built or are in the planning stage for Western European nations alone. This does not include Russia and its Communist bloc. Italy alone is reported contemplating 40 machines and one Italian company, for example, already one of the biggest, has plans to double its production. Even in little Switzerland there are eight new or projected machines. Of course, these programs will push many old and inefficient machines onto the scrap heap.

In nearly every company of importance in pulp and paper, the owners and directors are convinced they cannot stand still in the face of the wave of prosperity and the rising appetites for paper and paperboard. Their engineers are spending long hours at the drawing boards. At almost any mill of importance from France to Austria, one will see concrete being poured, the framework of new plants going up.

Market Blocs Successful

The growing paper business in late 1960 has made the new European market blocs–the European Free Trade Association (Outer Seven) and the European Economic Community (Inner Six)–much more palatable to many paper industry leaders who otherwise would have been most unhappy in their new government-enforced trading unions. British and Austrian paper industries, for instance, were greatly alarmed by EFTA, and feared destructive competition with the trade barriers being lowered in that group of nations. But British leaders, at least, are now much more relaxed and declare with confidence that they expect no price wars with the Scandinavians.

A very important tip I learned in Switzerland is that the EFTA secretariat in Geneva has indicated that import duties for pulp and paper would be reduced in the European countries by 10% on Jan. 1, 1961, and another 10% on Jan. 1, 1962. This is a result of recent EFTA and EEC conversations.

After talking with literally scores of industry leaders from 12 European nations, the two most important facts which emerge from these conversations are these:

1. The EFTA and the EEC will be merged, creating a training bloc comparable in strength (population and buying power) with that of North America on one side and Soviet Russia on the other. But there will be plenty of business and markets for everyone in Europe and this also means for North American companies and Russia, too.

2. Every nation in Europe is going to have a sound and successful paper industry. They will not expand greatly in pulp, newsprint or paperboard–in some small nations not at all–but they will make other printing papers, tissues, special grades and they will successfully build their industries on a basis of quality and service to their national customers. They will do more business across borders, but mostly within Europe. They will compete successfully on this basis.

I found much agreement by experienced leaders on these two points, both on the Continent and in Scandinavia.

More Newsprint and Board

Mills will thrive on the Continent, even in a big European trade bloc which opens doors for paper imports. On the other hand, there are some 5 new newsprint machines planned or going into production within about a year or so in Finland alone. Both Sweden and Finland are stepping up production of paperboard with four new plants of large size–and possibly another which has not been announced. Europe is hungry for paperboard and many companies are building box converting plants. North Europe will supply more newsprint and paperboard to the world and the Continent of Europe.

In Italy, use of paperboard boxes for fruits and produce is now developing in a very big way. In Germany, this development has been going on a long time. In Britain, the market for

paperboard increased 100% in a decade. Britain, France, Germany and Italy are opening hundreds of supermarkets each year and here, of course, the products must be sold in printed, attractive packaging.

U.S.A. Wants European Concessions

The "viewing with alarm" over the creation of the European trade blocs, and eventually, presumably just one European bloc, now has shifted to the United States. As the EEC approaches its third annual lowering of tariffs among its members, and as EFTA started a similar graduated program of lowering internal duties on July 1, the American Paper & Pulp Assn. has officially urged the U.S. government to press for similar concessions within Europe for its exporting companies.

GATT Sessions Begin

On Sept. 1 the long-anticipated GATT negotiations began in Geneva. The delegates from 44 nations have moved into this Swiss city for talks and trades that will carry on for many months. All these nations want a slice of Europe's rich prosperity "cake." Seven of the nations are non-members of GATT but will join negotiations.

Not to be forgotten are the negotiations quietly moving along to bring Finland, the 4th biggest producer of pulp and 9th of paper, into EFTA, as an eighth member and enabling it to enjoy all the benefits of EFTA's lowered customs. Soviet Russia, on the other side of the European prosperity boom, is looking out for its interests, too, and it has at long last said Finland can join EFTA if it continues its most favored nation treaty and trading with Russia. Finland has similar treaties with all GATT members. I happened to be in Helsinki, looking down from my hotel window on two visiting Russian destroyers. During the summer there were similar visits by Dutch, Swedish and French war ships. This trade and exchange with the USSR is, of course, quite natural, as USSR is the next-door neighbor.

Russian Mills Running Strong

Incidentally, on this trip I went to the relatively new Finnish-Russian border, where the lineups of high wooden Russian watch towers were in view, and clearly in sight—a mile or two across a span of water—the two big Enso Gutzeit mills, sulfite and kraft, which were running full blast. There have been stories in the industry recently that the Russians had shut down these mills. I can say they are now running and great billowing clouds of smoke are coming night and day from stacks of both mills.

What Will Be Done at GATT

Although, in the U.S.A., there have been fears that tariffs would be raised against American paper or pulp, I have heard no such reports over here. It is a fact, however, that a balancing of the external tariffs has been part of the plan of the European blocs since they were first discussed years ago. For example, France and Italy may now have external tariffs on some products which are higher than the external tariffs of Germany and Holland, their fellow EEC members. The avowed policy is to bring these tariffs together, so some may be lowered while others are raised, but the declared objective is an arithmetic balance.

The first three or four months of the GATT (General Agreement on Tariff and Trade) sessions will be spent by the 44 countries, principally, bargaining so as to make the Common Market (EEC) tariffs and other European tariffs as non-restrictive as possible.

Estimated 1958 Capacity and Current Expansion Plans by Regions of World

	Rated capacity 1958				Current expansion plans				Estimate of future rated capacity				
	Newsprint	Other paper and paperboard	Total paper and paperboard	Paper pulp	Newsprint	Other paper and paperboard	Total paper and paperboard	Paper pulp	Newsprint	Other paper and paperboard	Total paper and paperboard	Paper pulp	Estimated target date
	1,000 metric tons												
North America	8,520	32,530	41,050	33,730	680	3,240	3,920	1,240	9,200	35,770	44,970	34,970	1961/62
Latin America	150	1,600	1,750	700	405	915	1,320	1,335	555	2,515	3,070	2,035	1964/65
Western Europe	3,905	14,481	18,386	14,620	832	3,500	4,332	4,688	4,737	17,981	22,718	19,308	1965
Africa	—	296	296	156	60	115	175	349	60	411	471	505	1965
Near and Middle East	14	75	89	44	40	264	304	90	54	339	393	134	1964/65
Far East	700	3,708	4,408	2,861	714	2,236	2,950	2,646	1,414	5,944	7,358	5,507	1963/65
Oceania	167	455	622	465	180	215	395	345	347	670	1,017	810	1965
Rest of the world	960	6,295	7,255	6,300	970	5,605	6,575	5,658	1,930	11,900	13,830	11,958	
World total	14,416	59,440	73,856	58,876	3,881	16,090	19,971	16,351	18,297	75,530	93,827	75,227	
Rest of the world:													
Eastern Europe	285	2,250	2,535	1,780	175	1,240	1,415	728	460	3,490	3,950	2,508	1962/65
U.S.S.R.	400	2,620	3,020	2,920	490	3,120	3,610	3,380	890	5,740	6,630	6,300	1965
Mainland China	275	1,425	1,700	1,600	305	1,245	1,550	1,550	580	2,670	3,250	3,150	1965

This table is in "The World Demand for Paper to 1957," which has just been published in book form by the Forestry and Forest Products Division, FAO of United Nations, Rome. In some countries, it is already claimed that these FAO estimates for future are too low. Of course, even as FAO book was being printed, Editor Al Wilson was told many companies were already revising expansion programs upward.

This is a valuable opportunity for U.S., Canada and many other countries to negotiate on tariffs with the six EEC nations before they implement their common tariff.

The ultimate goals of the European governments—and these goals have popular support, you may be sure, if not of all industries—are to end up with revenue tariffs only, for members of the trading bloc. A major goal is to be able to bargain as a unit. A further goal is political unity, and governments already are negotiating this point.

Both government officials and industry officials over here have told me that U.S.A. and other nations outside of Europe are unlikely to face higher tariffs than are in existence now, and some quota restrictions on paper imports, which have long been in effect, may even be continued. But on the other hand, GATT may engender many concessions for outside Europe which were not contemplated when the EEC was launched Jan. 1, 1959.

Industrial Bargaining by Nations

After this first three or four months of GATT general across-the-board negotiations, it is expected that there may be three or four months more of individual bargaining, where nations may get down to the quid pro quo questions. So, it will be many months before these matters are settled. There will be questions of great importance to pulp and paper industries in many of the 42 countries, but probably much too dull from the point of view of the public press, which so far has published very little about the huge meeting which is now taxing Geneva's hotel and rooming accommodations to customed to playing host to international conferences.

Swedish Expansion to be Revised

It is certain that a new and revised report on Swedish plans for expansion will be forthcoming. Only a short time ago the Swedish industry calculated that the total increase in woodpulp capacity would be about two million metric tons, between 1959 and 1963 to 1965. It was contemplated about one million of these tons would be converted into paper and paperboard. The rest would be market pulp.

The Scandinavian countries today are sold out of kraft pulps and practically sold out of other grades. And surprising as it may seem, there will be an actual shortage of unbleached kraft from Sweden next year for sale. This is because so much is going into linerboard, in which the demand is just as remarkably strong in Europe as it is for pulp. By 1962 the North European supply of market kraft pulp will be plentiful again. But it is a certainty that a new expansion program, revised in light of more recent developments, will be forthcoming in Sweden.

T. J. BOS is director of N.V. Papierfabrik "De Hoop" of Eerbeek, Holland. He is one of many Continental European paper company executives with whom the editor talked, in gathering facts for this article. As one of many buyers of woodpulp, Mr. Bos is keenly interested in the trends and developments which are reported here, as they affect his business very decidedly. He is associated with his brother and father in paperboard manufacture.

About 900,000 Tons More

From Canada there will be 300,000 tons of new market pulp from new mills by the end of 1962 and perhaps close to twice this amount from Scandinavia. But Scandinavia, on whom the Continental Europeans are counting for their major supplies, is falling behind the papermaking pace in Europe and frantically working to get more production to retain its historic customers all over the world. On the other hand, pulp shipments from America have greatly increased. One of the biggest pulp companies in America, meanwhile, estimates it will still be three years before supply and demand are balanced in the United States.

But despite this remarkable contrast in the situations in America and Europe, the word passed along these recent days is that there will be no price increases over here. The North European producers are making every effort to cut their wood and production costs and have made some notable progress in this respect.

Turn page for report on Scandinavia

Some Facts About Who Buys Pulp in Europe

Information is not easily obtained on how many mills in Continental Europe are dependent on outside sources for woodpulp, but contacting pulp salesmen on both the Continent and in Scandinavia, Editor Albert W. Wilson came up with some incomplete but interesting facts.

In France, there are 659 paper mills, according to one up-to-date account. Of these 181 buy woodpulp, mostly from Scandinavia, and secondly from North America. Smaller amounts come from Russia, the latter being classified by some users as "filler" pulp, and from Austria, West Germany, Yugoslavia, and other countries. This relationship of amounts from Scandinavia, North America and other nations obtains in most other countries also.

In West Germany there are more than 400 mills, with a remarkably large number in Bavaria (over 180), and of these, 261 are purchasing woodpulp.

Of Italy's more than 400 mills, 131 are woodpulp buyers.

In Holland, some 55 mills are pulp purchasers and this is a major portion of the total. Nearly all Belgium's 35 mills require outside pulp.

In Switzerland there are about 25 mills, and of these 17 are buyers of pulp. The Swiss have two market sulfite mills in their own country and the tariffs on incoming pulps of these grades are relatively high.

Spain's 300 or more mills have been opened up to more pulp sales by recent government decrees and the entry of Spain in OEEC. So, the pulp market here is changing complexion.

Portugal has a eucalyptus sulfite mill, Caima, which has been selling worldwide, 8,000 tons or so a year. This amount is being doubled, and a new mill, Socel, southeast of Lisbon, will at first sell bleached eucalypt and pine sulfate pulp, before going into papermaking. Portugal has 70 paper mills, and Socel will be the fourth pulp mill.

Tariffs generally are not so high as to discourage most imports in Continental Europe but they vary. France has only a tariff on kraft pulp, now down to 4%. Spain has two separate tariffs, but not high. Italy has a protective pulp tariff which goes to the papermakers.

In the Mediterranean area, Greece, Turkey and Egypt are among customers for Scandinavian and North American pulps.

What Scandinavian Mills Are Doing

Many interesting developments viewed by editor in visits to northern operations. Major interest to pulp buyers.

● In Finland the average paper machine today is producing 17,000 tons per year, whereas in Sweden the average production of a paper machine is only 7,500 tons per year.

The expansion in newsprint in Finland is one of the most interesting phenomena in the European paper industry. It is now building in the north its eleventh newsprint mill. There are five new newsprint machines already in production, with a total of 21 machines, with more coming. With political and cultural development in many remote parts of the world on the march, Finland apparently is confident there will be a strong rising demand for newsprint.

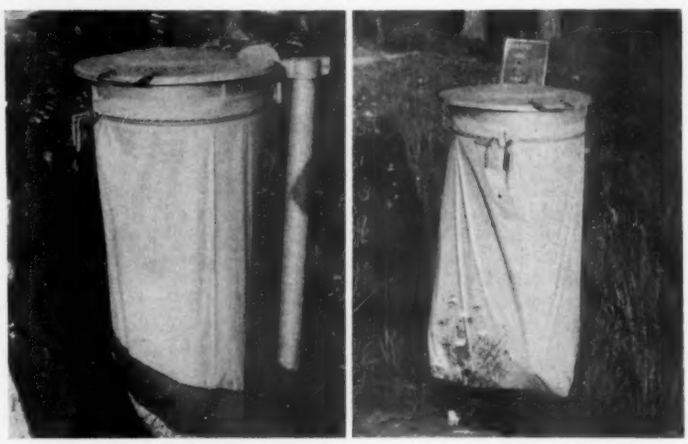
Finland is doubling its newsprint production to one million tons with present new machines and during 1961 the output will rise to 1,200,000 metric tons. Finland already is serving 70 nations with newsprint, about 20 more than Canada, the world's biggest newsprint producer. But Canada ships about five million tons to U.S.A. each year and only 800,000 to other nations.

Newsprint producers in Finland expect a shortage by 1965, despite the fact that countries like Pakistan, Chile, Italy, Japan and Switzerland have built their own newsprint plants and have become practically self-sufficient. In Scandinavia there is no expectation that Russia will have very much newsprint to export.

Alanko

Dietrich

LAURI ALANKA, on the left, is technical manager of the biggest Finnish company, Enso Gutzeit Oy, where he is a principal associate of that company's president, Wilhelm Lehtenin. **ERIK DIETRICHS**, right, has been manager for ten years of the Husum, Sweden, mill of Mö & Domsjö AB, and most of those years he has spent building it into the biggest kraft mill in Europe outside Finland. He is widely known in Western U.S. and Canada, where the pioneer Husum chlorine dioxide process was introduced some years ago with his assistance.



Paper Useful on Swedish Highways

Driving in Sweden from South to North—from mill to mill—Editor Albert W. Wilson took pictures of heavy kraft paper sacks. Scores of them are along most roads, at stopoff or rest spots for motorists, and they are invited to throw their waste and garbage in these sacks. "SCRÄPET HÄR TACK!" it says. These stopoff spots are very frequent on European highways. In Sweden, one must drive on the left hand side of the road. A national plebescite defeated a proposition to change to right hand side driving which is common in almost all other countries, Britain being one exception.

Visits to Two Big Finnish Mills

In Finland, I was able to visit two important mills in the eastern borderlands near Russia—the huge Kaukopää, where No. 3 kraft machine started up only last March and No. 4 will be running by the end of this year, and the Summa newsprint mill, hewn right out of the forest just five years ago. Both are Enso Gutzeit mills.

But this is not the only company expanding in Finland. Wärtsilä Koncernen AB is building a 4700 mm wide machine for writing and printing and carton paper for United Paper Mills in Jämsänkoski. Among the new machines to make newsprint there will soon be one at Kymmene's Voikka mill. Another is being built by Valmet Oy for the Myllykosken mill. Also a big Beloit crepe paper machine is for Serlachius Oy's Mantta mill. Wärtsilä delivers a 7050 mm wide newsprint machine to Veitsiluoto Oy next June.

My visit to Kaukopää was especially interesting, as this is Finland's biggest operation, with 320,000 tons production last year. Both of this year's machines are 270 inches wide, both Beloit machines. No. 3 already is running at 2,000 feet per minute. No. 4 will probably make mostly bleached grades. A battery of Sutherland refiners will precede it, as with the others, this time eight of them and eight jordans. In addition, a new hardwood pulp mill—no paper here—is being built three miles from the main plant, with seven stationary digesters and a Wärtsilä bleach plant. At Kaukopää, construction of new units and additions has been continuous since the mill was started in 1949.

The five year old Summa mill with its two Beloit newsprint machines, running at 2000 and 2100 feet per minute, was most interesting because here is a mill without a woodyard, each day's supply being delivered by rail and truck direct to the mill conveyors. Its wood is 100% white spruce, 62% of it from farmers. From Russia comes a small amount, about 4%.

New Mill for Lapland

Now far north in Lapland, a new birch market woodpulp mill is projected by Dr. Gunnar Hedlund of Stockholm, former Swedish minister of the interior, and political head of the Swedish Farmer's Party. He and his group have introduced two new mills in Sweden with farmer cooperative ownership. In the new Lapland project, Dr. Hedlund says that two big British companies and one in Germany are interested in supporting it and would take the pulp. This northern area of Finland has not been developed as the rivers here run to the Arctic. The Norway and Finnish governments still have their plan for a mill even farther north at the Arctic ice-free port of Kirkenes, Norway, near the Russian border. Wood would come from Finland.

The first mill I visited in Sweden was the Skogsagarnas operation at Mönteräs, which is now making 80,000 tons of sulfate in a modern plant built and managed by Rutger Martin-Löf. Of this 50,000 is bleached. Dr. Hedlund is chairman of the board of this company owned by 6,000 farmers. This mill is to be doubled in size.

Meanwhile Dr. Hedlund's farmers are building another cooperative kraft mill for fully bleached pulp at Morrum, just 300 kw south of Monsteras, with capacity for 120,000 tons. Hylte is starting to build just 50 km from Morrum, in this case a magnesia base sulfite operation with Babcock & Wilcox recovery unit. This accounes for considerable development in forest utilization in the south of Sweden, where there is an excess of wood supply.

In the north, the state government is building a 100,000 tons per year linerboard milll in Petea, and a state industries plant already is making 100,000 tons of pulp and paper at Carlsborg. At both Petea and Morrum, the consulting engineer is Howard Simons of Vancouver, British Columbia, Canada.

Svenska Cellulosa Board Mill

Svenska Cellulosa AB also has its big linerboard mill at Munksund, in northern Sweden, moving rapidly toward production of 100,000 tons a year. Claes G. Hall, son of Gosta Hall, executive vice president and sales director of Korsnäs AB, is in charge of sales for this new production, working under Sverker Kastrup, general sales manager for Svenska Cellulosa.

Expansion at Korsnäs

Korsnäs at Gävle, with a young new president, Goran Lindblom, who came from Halmstad Iron Works, is being expanded and modernized with kraft pulp output going up to 160,000 tons from 115,000 in one and one-half to two years. Bleaching capacity for sulfite and sulfate is being increased to 160,000 tons, and a part of this expansion is in birch. It will have a new Walmsley paper machine, for MG paper, by the middle of 1961.

Skutskär, Stora Mill Growing

Nearby, the Stora Kopparberg mill at Skutskär, under Per Collin's management, is carrying on with its rapid expansion—15% this year, 20% next year and 65% by 1962. There will be three KMW machines side by side, each 4.2 meters wide, two already in, one for sulfate pine and one for sodium sulfite, and the third for sulfate birch will come later. Especially interesting are new space-saving Radiclones for cleaning and screening ahead of the machine, each with 400 combs in the unit, supplied by Projecting Co. of Stockholm. New pulp layboy equipment and a very up-to-date automatic conveying wrapping and finishing system are other features.

By a European continuous concrete pouring process, Stora built up walls of the new B&W soda recovery plant, 225 ft. high, in just 19 days, and the 300 ft. stack in 22 days.

New Development at Billeruds Mill

Billeruds AB also has been expanding, now erecting No. 5 paper machine, a Walmsley with KMW inlet, at Gruvön mill, the first machine in Sweden to have marking rolls at the Yankee to produce ribbed paper for wrapping, instead of using special felts. This 180 in. machine will have a new British Winders underfeed type winder. One of these British winders is serving the 215 in. No. 4 machine started up in late August.

An Ekstroms economizer with the latest B&W 400 ton recovery boiler for the integrated sulfate mill at Gruvön is proving exceptionally successful in reducing maintenance costs and reducing necessary washings to three months intervals. Also interesting is that Billeruds has the first 12-knife Norman helical type blade chipper in Sweden, made by KMW.

Uddeholms Expansion

Uddeholms AB, world famed in steel as well as pulp and paper, is pressing forward with modernization and expansion on a broad front in its Skoghall mill near Karlstad. Paper pulps for market are being increased in all, some 110,000 tons, mostly rayon and high alpha, will be available for marketing. All four machines are being modernized, complete new wet ends as well as some new presses and addition of dryers. This Uddeholms program has been going on for

Kastrup Sten Dietrichs

THESE THREE MEN, for Svenska Cellulosa Aktiebolag, keep constant touch with the pulse of the world markets for woodpulp. **SVERKER KASTRUP,** right, is general manager for this leading worldwide marketing company, and his right hand men in directing pulp sales are **JAN STEN,** middle, and **GUNNAR DIETRICHS,** right. From Sundsvall, in North Sweden, their work takes them to many countries.

SCANDINAVIAN COMPANIES are long experienced in serving paper industries and markets all around the world. They must keep abreast of all the various economic trends of the world. One of the men in Sweden who have this responsibility is **GUNNAR HINDEMARK** (above), vice president-economics and finance, for Billeruds AB.

Haug Blikstad Collin

AK. BORREGAARD is Norway's greatest industry and two men who keep its Sarpsborg works, where chemicals, pulp and paper are made, in the forefront of new ideas are **FINN BLIKSTAD,** vice president and technical director, and **KAARE HAUG,** pulp mill manager. On the right is **PER COLLIN,** manager of all Stora Kopparberg's forest products industries at Skutskär, Sweden, each year growing larger.

a long time and has many phases to it, in kraft and sulfite mills.

The Uddeholms steel works at Degerfors is producer of a special compound digester, united stainless to mild steel and rolling to thickness desired. In all, some 40 complete digesters have been delivered to mills and in addition, 30 sets of material delivered to other machine firms who did the welding parts.

A $32 million expansion is just underway at the Fiskeby AB mills. This calls for a new kraft pulp mill, a new birch semi-chemical mill, a new KMW paper machine and a giant kraft bag paper machine from Beloit, and many other additions.

Mö och Domsjö and Others

The Mö och Domsjö mills, at Husum and Örnsköldsvik, likewise have been busy with expansion. The Husum mill, under management of Erik Dietrich, originally built over 40 years ago, has become one of the largest kraft mills in Europe – the largest outside of Finland. Now in his 12th year as manager, Mr. Dietrich has carried out a broad expansion which in bringing total production to 720 metric tons a day, about 100 more than a year ago and the growth has been going on for several years. No. 4 machine with a Dorries wet end, 4.2 meters wide, is producing about one-third of the total. Four new digesters, giving 16 in all, were installed a year ago. This mill with eight bleach stages, all Kamyr equipment, was a pioneer of chlorine dioxide bleaching.

Extensive improvements and additions are being carried out at Wifstavarf AB, near Sundsvall, with a new Wärtsilä kraft machine from Finland, new batch digester for market pine kraft and other equipment. The Bergvik mill near Söderhamn has a new bleach plant.

These are only the mills which were in the course of my trip, and quite a few others in Sweden are likewise adding equipment for more production or for conversion of pulp to paper or board.

Developments in Norway

In Norway, there are a number of interesting operations. The 600 or more delegates who will attend the All-Scandinavian Pulp and Paper Conference in Oslo next year (May 29 to June 2) will be taken on a number of excursions. Printing paper makers will have a chance to see the Union Paper Mills at Skien and Hunsfors at Kristiansand. For kraft paper makers, a trip is planned to Borregaard Mills in Sarpsborg, especially to see the Zimmermann wet combustion process now operating there, and to M. Peterson & Son Mills in Moss. A cellulose group will see Tofte Cellulose Co. at Tofte, as well as Borregaard. For greaseproof paper and chlorine dioxide bleaching, Greaker Cellulose Co. will be of interest.

Kammerforsbruk, with the new flash drying Glomera technique and special baling, at Krageroe, and also the Bowaters Risoer mill and Treschow-Fritzoe in Larvik will be toured by mechanical pulp makers. A paperboard group goes to Mesna Kartonfabrik in Lillehammer and to Rena Kartonfabrik in Rena. Wallboard men will see Berger Langmoen in Brumanddal and Hunton Bruk in Gjoevik. And printing and converting plants will be open in Oslo.

Cederquist Wilson

KARL N. CEDERQUIST, chief of Stora Kopparbergs Central Laboratory, discusses his more than 30 years of experience in developing a successful sulfite recovery process–the two stage soda base system–with Albert W. Wilson, editor of PULP & PAPER, who is on the right.

In Denmark, United is Busy

In Denmark, the major company is United Paper Mills (A/S de Forenede Papirfabbrikker), whose plants make 44% of all the paper consumed in this little country. Its mills make 88% of all Danish paper production. By courtesy of its managing director, Adam B. Bendix, I was able to visit its mills with ten machines in Naestved and the unusual straw pulp mill it operates at Fredericia, in which farmer suppliers own 50%–an arrangement which keeps straw prices more stable. I saw a new Kamyr $C10_2$ generation and bleach plant here. Of course, United has other mills in Denmark, but Naestved was an unusual experience, as at several places in these sprawling works, new construction is going on, all at one time, and management has to be very agile to keep an eye on everything that is being done. A new Beloit tissue machine starts up this year-end. It will be 3.4 meters wide. Much rebuilding of No. 10 machine, and one of the new one-belt unwinding stands made by Jagenberg, which now follows No. 10, are among many interesting things going on here.

New Machines for World— 266 from 1955 to 1965

While in Scandivania I was shown a carefully calculated estimate on new paper machines for the world. This was an interesting document. It was based on an average size and production capacity. An average machine was estimated to be 4 in. wide, with capacity of 30,000 tons per year.

On this basis, there would be 113 new machines built in the period, 1955 to 1965, and 153 in the period, 1965 to 1975.

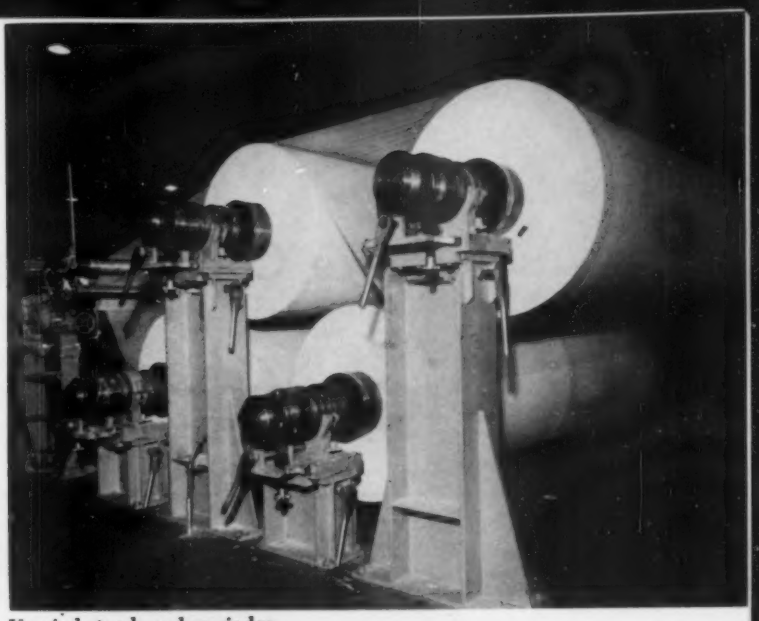
BERTIL FOGMAN, dipl. engineer, is in charge of international sales for the Thermo-Technical Dept. of AB A. Ekströms Maskinaffar, Swedish pulp equipment manufacturer.

To Attend Engineers Meeting, Introducing Equipment to U.S.

Touring the United States from Coast to Coast, and attending the TAPPI Engineering Conference in Jacksonville, Fla., Oct. 24-28, is Bertil Fogman of Sweden. His mission is to introduce to America the Ekströms economizer, already in use in about 100 European and other mills outside North America.

Mr. Fogman believes that savings in maintenance with these gilled tube and compound type economizers will make them attractive to pulp recovery departments. A 400-ton recovery boiler at Billeruds mill in Gruvon, Sweden, equipped with Ekströms economizer and steel shot cleaning is credited with making big savings in maintenance and requires washing only every 3 months. This economizer is going into the Stora Kopparberg-Scott mill in Nova Scotia and also in a 700-ton Babcock & Wilcox boiler for Kemi Oy, Finland.

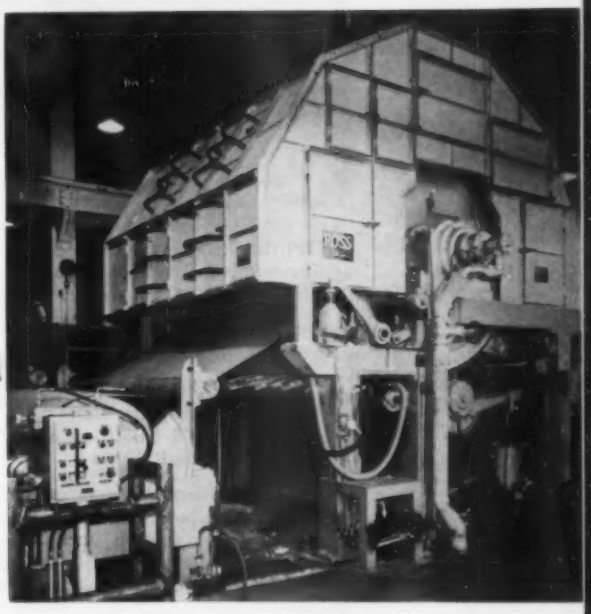
NEW AT SORG: press and Fourdrinier sections.



Unwind stands and rewinder.

Sorg Rebuilds No. 3

as part of $200,000 modernization



NEW Yankee dryer and reel.

—Middletown, Ohio

● Rebuild with two-fold reason.

That is the story of the recently-completed project at Sorg Paper Co., Middletown. No. 3 machine is the center of attraction. It has been modernized in a major program that cost some $200,000.

Work on No. 3 was only part of an over-all up-dating of production and finishing equipment. Reasoning had twin bases:

Basically, much of No. 3's innards had been in operation a quarter of a century and needed relief. It was somewhere in the mid-30s that the machine had been converted from waxing paper to facial tissue. And the 25-year-old components were causing excessive maintenance and loss of production.

Secondly, Sorg Paper—in face of increasing demand for high-quality wet-strength tissue—envisioned a 25% production increase as a necessity in the 1960 competitive picture.

All engineering and equipment was supplied either directly or indirectly by Patton Mfg. Co., Inc., Springfield, Ohio.

The Yankee dryer was relocated and a new suction press installed. The entire paper machine drive system was replaced. The former 200-hp drive motor was utilized, a new line shaft provided and new drives installed for couch, suction press, Yankee dryer and reel.

Former Slice Utilized

A new headbox was supplied by Patton utilizing the former slice and providing an adequate head for increased machine speed.

The new suction press is equipped with a 24-in. Manchester Machine Co. suction roll. The press is air-loaded, and the felt stretchers on the bottom felt and pick-up felt are air motor-operated. Felt rolls are rubber- and fiberglass-covered and equipped with anti-friction bearings. Felt runs were all lengthened to accommodate longer felts for better running conditions.

A high-velocity hood was designed and supplied by the J. O. Ross Engineering div., Midland-Ross Corp. This unit is said to give a 20-30% increase in evaporation rate. Hood was designed for use with the present Yankee dryer. It can, however, be easily adapted to a larger dryer at a future date.

A new horizontal track reel was designed by Patton to provide a constant tension on the paper. This is important in winding lightweight crepe.

Two beams having the same height and center line as the horizontal track serve as a place for roll storage. Two removable rails are provided between the track and storage beam to provide access to the winding roll.

Drive for this reel is a General Electric Co. Kinatrol eddy current coupling packaged adjustable-speed unit. This, says Sorg, provides the speed variation necessary to the operation.

Floor Replaced

A four-roll unwind stand ahead of the calender stack and rewinder was provided to make possible production of four-ply tissue rolls.

Rolls of paper from storage rail to unwind stands are handled by a new crane installed during the modernization project.

As part of the machine rebuild a portion of the machine room floor was replaced. For the section beyond the wire, all-new machine framing was installed.

Buckeye Cellulose Reports:

Digester Corrosion Solved

Buckeye Cellulose Corp. has 14 kraft digesters at its Foley, Florida mill. Not one of these digesters has shown any sign of fissuring or weld cracking during annual inspections that have been made since installation. No significant measurable corrosion or pitting has occurred either in weld metal or base material.

It appears, says Buckeye, that the use of weld metal with an exceptionally high ferrite content has eliminated all problems of weld cracking and still provides adequate corrosion resistance to withstand the digesting liquor.

Digester corrosion has increasingly plagued the alkaline pulp industry. Despite concentrated efforts to stop corrosion, indications from a soon-to-be released TAPPI digester corrosion report show that corrosion rates are increasing. Details of the study of carbon steel and Inconel clad digesters will be revealed during the forthcoming TAPPI Engineering Conference in Jacksonville in October.

The number of kraft digesters in the U.S. is estimated to be about 650. The average digester costs upwards of $35,000 without installation and has a life expectancy, without recladding, of about 10 years.

The industry has made an earnest inquiry in the past few years to solve the problem. Some methods show promise. While they do not solve the problem completely, they do at least slow the rate of corrosion and give the industry temporary respite during which it can have additional time to work on the problem.

Showing promise have been the use of new metals in digester construction; the use of overlays, some by automatic welding equipment; and anodic and cathodic protection. Still the problem continues.

For some, that is. Buckeye appears to have solved this problem. During a visit to Foley, Editor Albert W. Wilson learned that this mill's 14 digesters had no corrosion problem. For kraft pulping this is quite an accomplishment. This exclusive report has been written especially for readers of PULP & PAPER and details how Buckeye solved its corrosion problems.—THE EDITORS.

By D. FOSTER, Jr.
Engineering Division
The Procter & Gamble Co.
Cincinnati, Ohio

● In recent years digesters used in sulfate pulping have been subject to severe corrosion. Carbon steel digesters fail rapidly, and it is not unusual to provide 1-in. corrosion allowance to obtain economical life. Stainless steel has shown some pitting and stress-corrosion cracking in this service. Inconel has also shown a tendency to pitting in some digesting processes. Most of this corrosion has occurred in the vapor phase above the charge. Loss of a digester due to corrosion is expensive at best and can be disastrous if failure is by explosion.

Buckeye Cellulose Corp., a subsidiary of Procter & Gamble Co., operates 14 digesters at Foley, Fla., in what is essentially a sulfate process. Nine of the digesters have been in service since June 1953 and five since September 1958. The original nine were made of Lukens clad steel and the last five of Chicago Bridge & Iron Hortonclad.

Before the mill was built corrosion tests were made in the laboratory and in pilot plant digesters. However, these tests were not conclusive, and the final details of the process had not been definitely established. Type 316 stainless steel was chosen because of its high all-around corrosion resistance and because of the good condition of the pilot digesters.

The low carbon grade Type 316 (0.04% carbon max.) was used because we believed it was necessary to use a stress relief heat treatment for the A.212 backing material to remove residual stresses due to welding and any brittleness caused by its rather high carbon content. A heat treatment of 950°F for 5 hours was proposed because there would be no sensitization of Type 316L due to precipitation of chromium carbide at this temperature.

Lab Tests Were O.K. . . . But

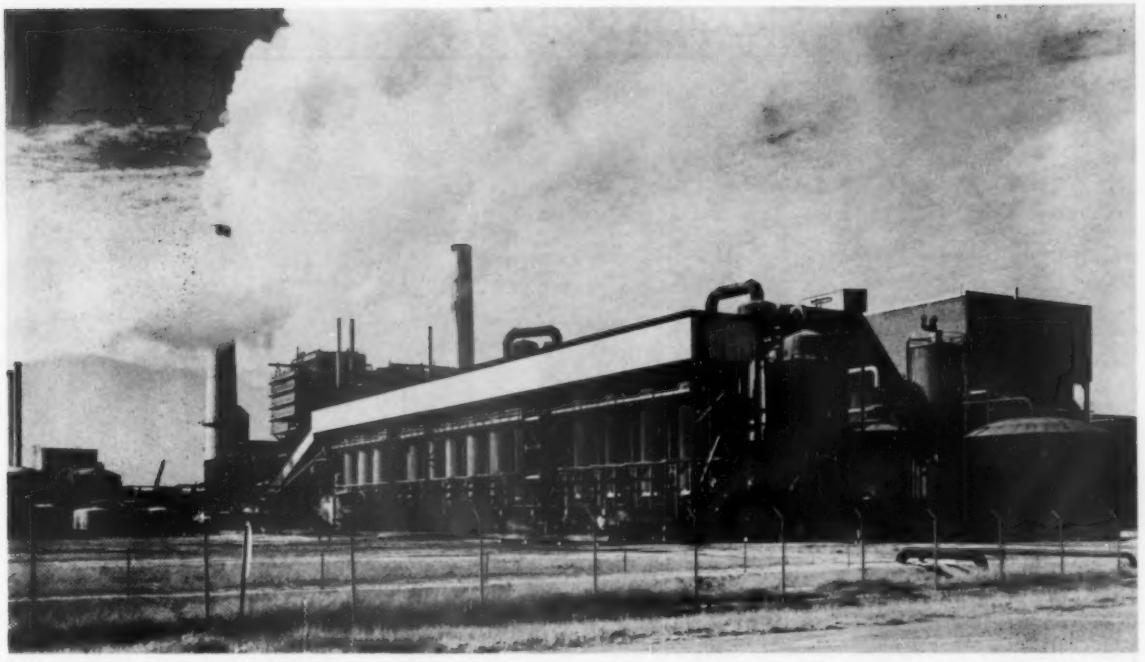
The fabricator (Graver Tank) and Procter & Gamble developed a preliminary welding procedure that met the requirements of the ASME Code and showed satisfactory corrosion resistance in laboratory tests. But, when the procedure was used on the vessel itself, fissures were found in the weld metal. (The procedure was as shown in Fig. 1.)

Two manual beads were deposited on the inside of the carbon steel groove using Class E7016 electrodes. The outside of the carbon steel was finished using the submerged arc process. The cladding side of the joint was welded by first depositing a layer of three barrier beads of Type 310 stainless weld metal. The barrier layer was then covered with two layers of 316L beads. The carbon content of the 310 weld metal was deliberately kept low to prevent excessive carbon contamination of the 316L cover beads.

The cover beads were made with conventional type 316L electrodes, which resulted in about 2% ferrite in the deposited weld metal. The fissures were found in the middle layer of beads and extending into the top layer. They were made visible for inspection by grinding off 1/16 in. of the completed weld, etching with aqua regia and using dye penetrant (Fig. 2). Not satisfied with these results, the engineers believed that clad welds could be made that were as resistant as the cladding used.

Ferrite Content Is Key

Fissure-free welds were considered a necessity to avoid cracking troubles in operation of the digesters, since it now became evident that several other occurrences of cracked welds in operating digesters had been due to fissured weld metal. However, it was also believed that increasing the ferrite content of the weld metal to the more usual 4% would be detrimental to the general corrosion resistance. It has been customary in the austenitic stainless steels, which are known to be sensitive to fissuring, to balance the composition of the weld metal to



FOURTEEN DIGESTERS at Buckeye Cellulose Corp. figure in this report on how corrosion was minimized. Nine digesters have been in service since 1953, five since 1958.

contain approximately 4% ferrite. This amount of ferrite eliminates fissures but at the same time greatly reduces the corrosion resistance. Rapid corrosion of the weld metal was as undesirable as cracking.

A total of 25 test plates were made by the fabricator and analyzed. Various combinations of weld metals were used in an attempt to produce a fissure-free weld of satisfactory corrosion resistance.

No welds found to be fissured were considered further. When welds were found to be fissure-free, they were subjected to further tests to insure that they were in the best condition to resist corrosion. These tests included the boiling 65% nitric acid test, the Strauss Test and a 10% nitric acid, 3% hydrofluoric acid test for three periods of 4 hours each.

6% Ferrite Is Answer

The final series of test plates were made with the weld metal adjusted to 2%, 5% and 8% ferrite. The welding process was changed from inert gas shielded metallic arc to manual arc coated electrodes, and the welding groove on the stainless steel side was narrowed by 30%. These changes were made to reduce thermal gradients and the total amount of expansion, respectively. It was found that only the weld containing 8% ferrite was free of fissures. It was concluded from these tests that 6% ferrite was the critical amount to prevent fissuring. As an added safeguard against fissures, the electrode coating was changed from lime-titania to lime, since a lime coating had been shown to be less conducive to fissures than the lime-titania.

In the various corrosion tests it was

FIGURE 1—Fissures found in weld metal when used on digesters did not show up in laboratory tests.

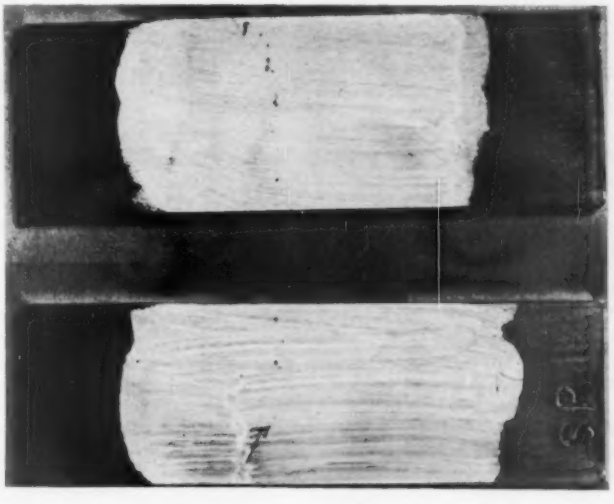


FIGURE 2—Fissures were found in middle layer of beads and extending into the top layer. They were made visible for inspection by grinding off 1/16-in. of the completed weld, etching with aqua regia and using dye penetrant.

. . . DIGESTER CORROSION SOLVED

METALLURGICAL LABORATORY at Procter & Gamble Co.'s central research headquarters in Cincinnati has a well-equipped welding section (left), uses special metallurgist's microscope (right) for surface examination of metal as one of instruments for testing effectiveness of corrosion resistance tests at Buckeye.

found that while the corrosion resistance of the as-welded joint made with this procedure was almost equivalent to that of the original low-ferrite procedure, the stress-relief heat treatment for five hours at 950°F caused an increase in the corrosion rates. (In boiling 65% nitric acid from 0.00288 in. per month to 0.00508 in. per month.)

Therefore, permission was obtained from the National Board of Boiler & Pressure Vessel Inspectors to stress-relieve the vessel before welding the clad side.

(The National Board is a group of heads of inspection departments of all U. S. political subdivisions who recognize the ASME Code for Design & Construction of Pressure Vessels. Its purpose is to promote greater safety of life and property by securing concerted action and maintaining uniformity in the construction, installation, and inspection of boilers and pressure vessels.)

We believed that the small proportion of the total weld that would be made after stress-relief would not cause dangerously high stresses. Results of the test were confirmed on two additional test plates, and these results agreed well with the original plate. Various combinations of 316L, 310 and 309 weld metals were tried, but all resulted in fissures in the welds. We decided that the high ferrite weld would be used, and that the digesters would be stress relieved before the stainless steel side was welded.

The procedure was qualified without incident, and several operators were qualified for work on the digesters. All 14 digesters were welded by this procedure, using the high ferrite Type 316L weld rod. During the welding the joints were checked periodically by grinding, etching and dye penetrant. No further fissuring was found.

Corrosion Eliminated

No evidence of fissuring or weld cracking has been found in any of the digesters during annual inspections that have been made since installation. No significant measurable corrosion or pitting has occurred either in weld metal or base material. It appears that the use of weld metal with an exceptionally high ferrite content has eliminated all problems of weld cracking and still provides adequate corrosion resistance to withstand the digesting liquor.

It is interesting that no stress corrosion has occurred in the clad shells of the digesters. It is known that the cooking liquor will cause stress corrosion, since all the Type 316L inserted nozzle liners used in the first nine digesters failed due to stress corrosion cracking in the first two years of operation. The liners were replaced with Inconel, which has stood up well. All nozzles 6 in. and larger in the Hortonclad digesters are made of Type 316L Hortonclad, and no trouble has been experienced.

Approximately three months were spent in development of the final welding procedure for the digesters. During this time four metallurgists and engineers devoted their time to the problem, as did two of the fabricator's metallurgists.

Plans for International Oxford Meeting

One of the most important scientific meetings in the paper industry will be the Oxford University fundamental research symposium, Sept. 24-30, in Oxford, England.

All plans for this international meeting are nearing completion according to Technical Section of the British Paper and Board Makers' Assn., which is sponsoring the event. All sessions will be held in the organic chemistry lecture theater of the Dyson-Perrins Laboratory.

The subject of the symposium is "The Structure and Formation of Paper." This will be a sequel to the Technical Section's first fundamental research symposium which was held in 1957 at Cambridge University. On that occasion the subject was "Fundamentals of Papermaking Fibers."

The Cambridge report may be ordered from the Technical Section, B.P. and B.M.A., St. Winifred's, Welcomes Road, Kenley, Surrey, England. Price is 55 shillings plus postage for British Technical Section members and Cambridge registrants and 75 shillings plus postage for all others. Technical Section officials describe this as "essential preliminary reading" for the forthcoming Oxford meeting.

How Sitka Finishes Dissolving Pulp

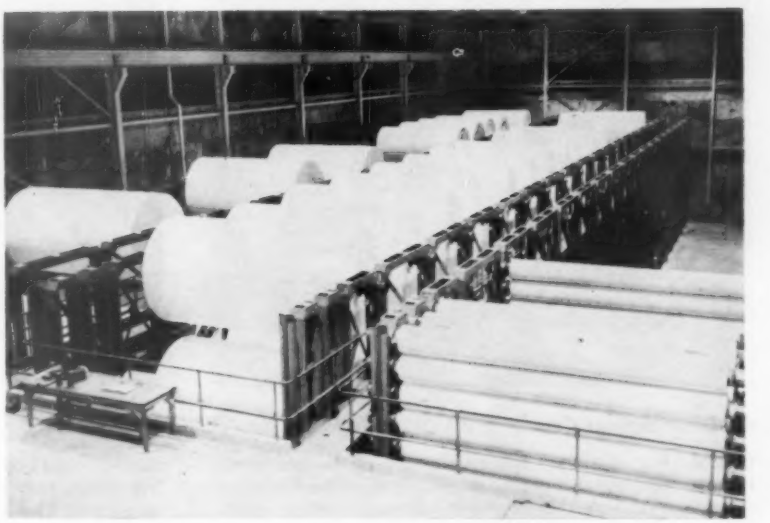
Unusual process refinements, heavy equipment and minimum of manpower overcome common problems in dissolving pulp finishing

• High costs (transportation, downtime, labor), remote location and technological progress were significant factors in designing, equipping and building the Alaska Lumber & Pulp Co. plant at Sitka, Alaska. This newest of MgO sulfite pulp mills started production late last year (story in Feb. 1960 PULP & PAPER).

The finishing room for processing the plant's entire output has specially designed equipment and handling refinements not previously incorporated in production lines of this sort.

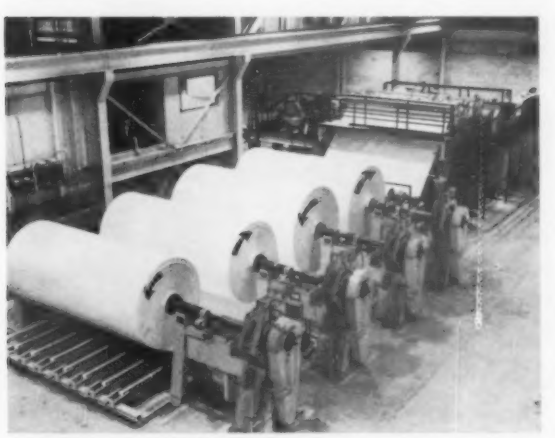
Harold D. Cavin, who has been building pulp mills over the past 30 yrs., was chief engineer for the entire Sitka project for which Rubens & Pratt, Seattle consulting engineering firm, handled design and engineering. Rocky Lindell, pulp finishing-warehousing-shipping consultant, developed the modern finishing facilities.

Of the production innovations, Mr. Lindell says "some were designed to overcome recognized deficiencies existing in other finishing installations, others to control the cost of finishing high grade dissolving pulp in small-sized Japanese bales."



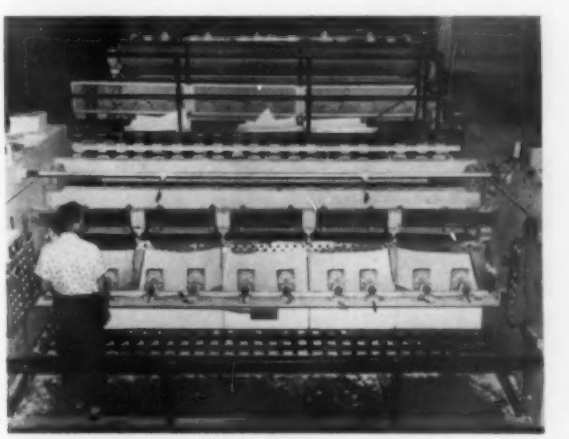
1. Jumbo Rolls . . .

are stored three deep on core journals to keep round shape. All rolls of top tier can be removed directly, those in the middle level by removing one roll. No more than two rolls have to be removed to reach any one unit from 168 roll storage. Empty cores, 14-in. dia., are stored at right.



2. Cutter Layboy Feed . . .

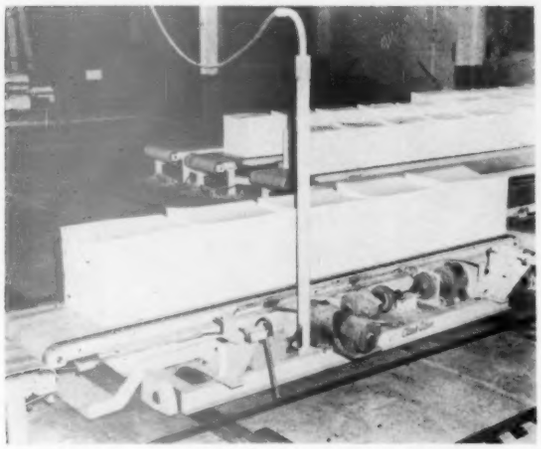
Backstands in this Clark-Aiken equipped finishing room hold four 15-ton jumbo rolls (168-in. face) per charge. Each pair of rolls turns in the opposite direction for back-to-back cutting. Sheet feed belts at lower left are motor driven at speeds up to 200 lfpm; are synchronized at higher speeds with (and driven by) cutter. Helper drives feed sheets to primary roll. Over-riding clutch permits free-wheeling after sheet is grasped.



3. Uniform Sheet Lengths . . .

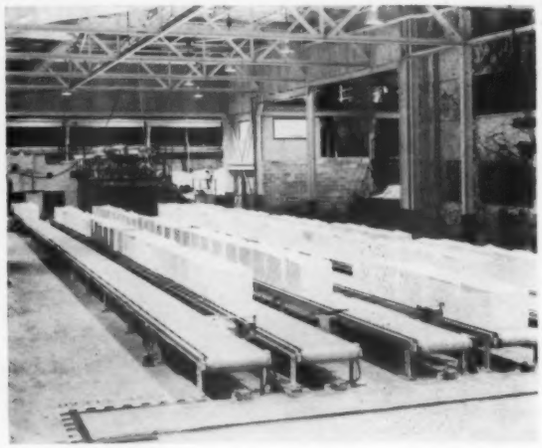
are produced by improved drive method. Variable speed 125 hp direct current drive draws power from motor generator with dynamic emergency braking. Layboy tapes (20 on top, 21 on bottom) have 200 to 800 fpm speed range. Fingers and finger tables are magnesium. High pressure hydraulic system gives maximum finger velocity. Heavy construction is featured in 500 fpm Clark-Aiken cutter and automatic layboy.

. . . Step by step progress of pulp from rolls



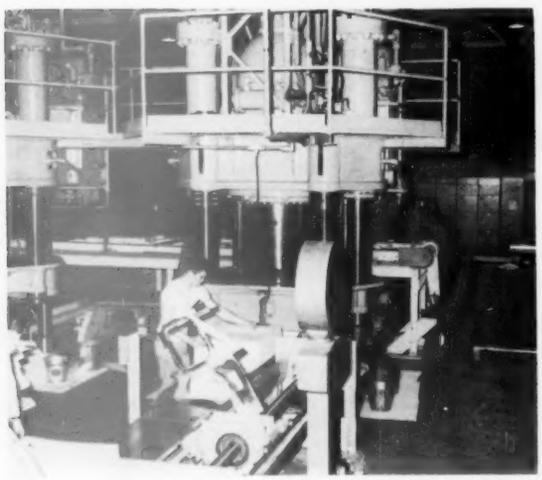
4. Distribution Car . . .

takes layboy load for delivery to any of six conveyor-storage sections at right background. Sustained vertical alignment of sheets throughout transport system results from appropriate speed differentiation of successive belts, taut belts, close spacing of "cannery type" conveyor rolls.



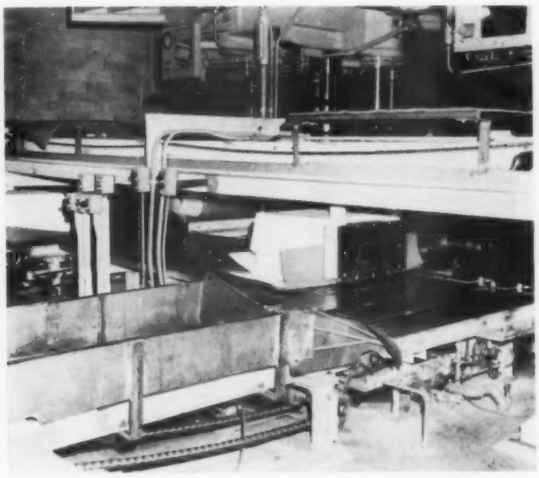
5. Live Storage . . .

consists of six 96-ft. lines with a total capacity for 36 layboy loads. One load can be seen emerging from layboy at far left. The specially-built belts are 28-in. wide, have 1/8 in. rubber facing on the front side, 1/16 in. on back. The drive pulleys are rubber lagged to prevent slippage.



8. Bales Discharge . . .

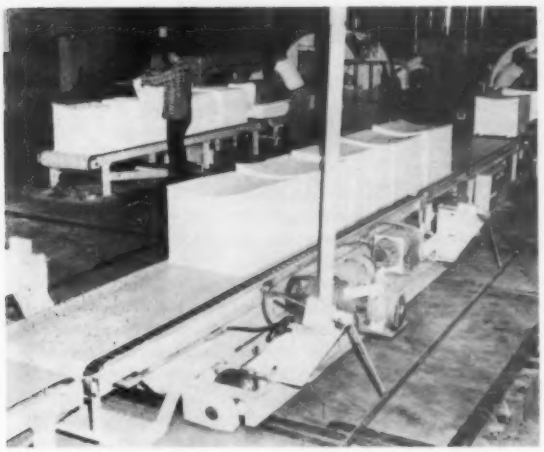
from roll-over to scale-feed section. Bale then moves to Fairbanks-Morse scale and brought to pre-determined weight before top "showa pack" is applied. It is then compacted in Washington Iron Works 1,000 ton hydraulic press.



9. Cross Conveyor . . .

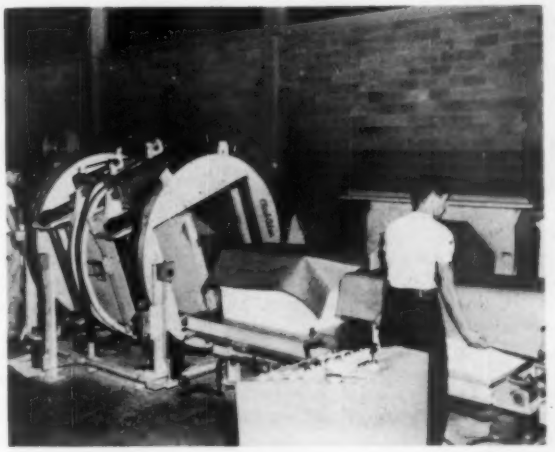
takes compressed pulp stacks from both presses, partially shown in background, and delivers them to either of two baling lines. Each baling line has two automatic tyers separated by automatic turntable. Top wrapper is applied at tyer feed station.

. . . to finished bales at Alaska Lumber & Pulp



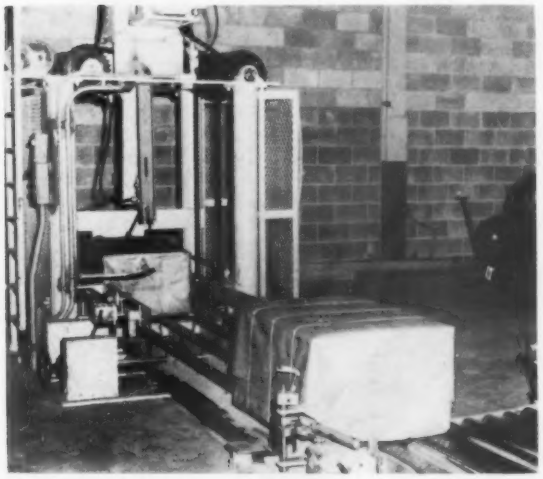
6. Transfer Car . . .

has automatic-manual controls and takes layboy loads from storage conveyors at left, stays in position with load until one of stacking lines clears. Car then moves into position, automatically discharges and returns to proper storage belt for next load. Layboy load is shown discharging to stacking line.



7. Air Driven Roll-Over . . .

rotates bale of pulp 180°. Pulp moves on air float tables instead of belts here. Stacks arriving from bale storage conveyor (ending at far right) receive bottom Japanese "showa pack." Operator applies pulp-sheet pairs, overlapping corners and edges to protect pulp, then applies bottom wrapper of two 85 lb. kraft sheets.



10. Finished Bales . . .

move from tying section by gravity conveyor at right and accumulate in units of three in Clark-Aiken lowerator where they are then transported to lower floor level.

11. Lowerator Discharges . . .

pulp bales to stack conveyor for removal by automatic lift truck in six bale units for transport to basement storage or as 12 bale units for hauling directly to dock warehouse 1,000 ft. away.

TAPPI Alkaline Conference Report

Pulpmen probe high yield pulping; continuous cooking; continuous bleach preparation; multi-stage sulfite and odor problems

By LOUIS H. BLACKERBY
Western Editor
PULP & PAPER

● Some 430 pulp specialists from the U.S., Canada, Mexico, Europe and South America made an unprecedented migration to the West Coast to attend TAPPI's 14th Alkaline Pulping Conference at Portland Oregon's Multnomah hotel. It is the first time that the Alkaline conference has been held outside of the South.

Probably the most interesting news that the pulp men heard was that Blandin Paper Co., long-admired for its pioneering work in trailing blade coating, is producing an ultra-high yield chemi-mechanical pulp using the Bauer M&D continuous digester. Reports of the success of this installation have circulated throughout the industry for the past ten months, but until Blandin's Technical Director Charles A. Richardson spoke at the Alkaline meeting there had been no official confirmation. Mr. Richardson revealed that Blandin is definitely getting over 90% yield.

Also outstanding in the program was a progress report on the Impco continuous upflow digester installed at Hammermill Paper Co. Royal H. Rasch, head of Hammermill's research dept., cited pulp uniformity as being excellent.

Pulp men who attended the meeting are still pondering and talking about studies made by Waldorf Paper that indicate the possibility of using the Magnefite process as a solution to odor problems for mills producing corrugating medium and bleachable pulp grades from hardwoods.

From the U.S. Forest Products Laboratory, which pioneered semi-chemical pulping, came news of studies of multistage sulfite pulping of jack pine, balsam fir and mixed oaks. Pulp produced had strength characteristics approaching kraft.

The success of Longview Fibre's continuous bleach plant system also attracted considerable attention. Installed three years ago, the plant has supplied the mill's total bleach requirements for kraft pulp without major change or repair.

Three mill tours took visitors to Crown Zellerbach Corp.'s Camas, Wash. mill, Longview Fibre Co. and Weyerhaeuser Co. plants in Longview. Collectively these mills, each in the 1,000-1,200 tpd class, represent a variety of production processes, products and modern developments. Processes include MgO, sulfite, NSSC, kraft, calcium sulfite, two continuous cooking systems. The group manufactures market pulp, paper, paperboard and a comprehensive range of finished paper products.

Chemi-mechanical Pulp With High Yield

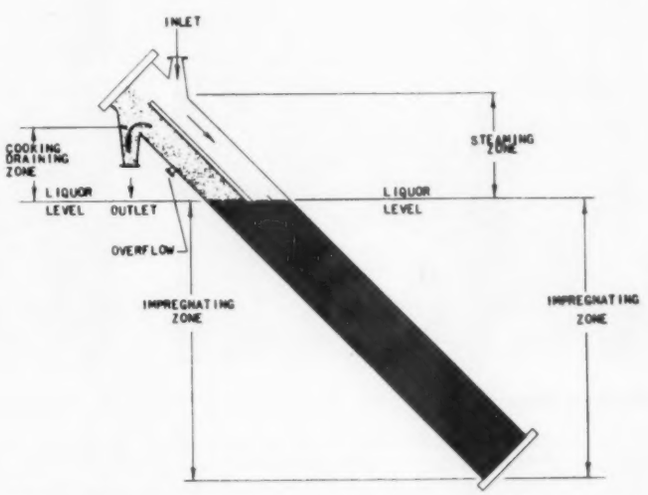
Blandin Paper Co., Grand Rapids, Minn., manufactures ultra-high yield pulp from balsam fir and produces about 32 tons of this chemi-mechanical pulp daily in a semi-pilot plant. Production involves pulping "small" chips by a continuous neutral sulfite process resulting in pulp of unique properties, including "very high yield, definitely being over 90%."

According to Mr. Richardson, the pulp is substituted for sulfite pulp to the extent of 20% of fiber furnish (representing about half the chemical pulp) on coating base stock being run on one machine at 1150 fpm. The resultant paper "has higher bulk and capacity, about same burst, and slightly lower tear as compared to the original sheet."

The chemi-mechanical pulp is used to the extent of 20% of the fiber on another machine making base stock at 1450 fpm. In this case it is substituted in place of 10% each of groundwood and chemical pulp. For heavier papers the substitution involves 15% chemical pulp, 5% groundwood. Properties of the paper "are about equal to the original sheet and the running properties are considerably improved."

The process involves feeding belt-weighed chips to an inclined Bauer Messing-Durkee continuous digester equipped with Grenco inlet and discharge valves. The chips are impregnated with neutral liquor (sodium sulfite & sodium bisulfite) for 15 min. at 280° F. and 85 psi. Subsequent processing in Pressafiner and two stage refining in disc refiners results in Canadian Standard freeness of about 425.

At this processing point the pulp gets its first-stage bleach (0.4% sodium hydrosulfite at 4.5 pH, low-density upflow tower), then it is washed, diluted, cleaned in 3-stage centrifugal cleaner, deckered and bleached with peroxides to 69 brightness. After that the pulp goes through a pump-through refiner for final freeness control to 350 CS. and into storage ready for blending.



CONTINUOUS DIGESTER is used by Blandin Paper Co. to produce neutral sulfite pulp of "unique properties, including very high yield, over 90%." M&D digester is inclined tube type, made by Bauer Bros.

Wetherhorn Thode Rothrock Rasch Mashburn Bacon

ALKALINE PULPING CONFERENCE was opened by David Wetherhorn, of Continental Can Co., Port Wentworth, Ga., chmn. of Alkaline Pulping committee. Presented papers at 1st pulping session: E. P. Thode, Institute of Paper Chemistry, Appleton, Wis., C. W. Rothrock, St. Regis Paper Co., Pensacola, Fla., R. H. Rasch, Hammermill Paper Co., Erie, Pa., R. T. Mashburn, Hercules Powder Co., Kalamazoo, Mich., V. W. Bacon, Northwest Pulp & Paper Assn., Tacoma, Wash.

Multistage Sulfite Pulping

Studies involving the pulping of jack pine, balsam fir, and mixed oak species by multi-stage sulfite processes at Forest Products Laboratory, Madison, Wis., have produced pulp with strength characteristics approaching that of kraft. This pulp is considerably brighter than kraft and beats more rapidly according to N. Sanyer, in charge of pulping research at the lab, who reported the results.

These studies of processes involved initial cooking at pH of either about 3.5 or 6 and using a sulfur dioxide or soda ash solution to complete the cook. Of the 2-stage processes used, best strength was obtained by low pH first-stage cooking followed by a neutral sulfite stage.

Initial cooking at 6 pH resulted in 6 to 8% higher yield on pulp-to-wood basis. According to Dr. Sanyer, this was "because of the increased retention of hemicellulose, but these pulps were weaker than those produced by bisulfite-neutral sulfite digestion."

The pulps of permanganate number 20 bleach readily in 3-stage treatment with chlorine, caustic soda and chlorine dioxide but those of 30 permanganate require a 5-stage bleaching sequence including two of chlorine dioxide.

Operating Experience with Up-flow Digester

Results of a year's operating experience with the up-flow Impco continuous digester by Hammermill Paper Co., Erie, Pa., show: (1) Uniformity of pulp is good, especially considering the wide proportions of hardwood species used. (2) Uniformity within the digester is excellent. (3) Pulp quality is essentially the same as batch Neutracel pulp. (4) Digester takes advantage of rapid penetration rate.

The Impco digester, according to R. H. Rasch, head of Hammermill Paper's research, produces up to about 200 tons of air-dry unbleached pulp per day by the Neutracel process (Pulp & Paper, Sept. 1959). This pulp is bleached and used in bond and other Hammermill fine papers.

Rapid penetration, according to Mr. Rasch, is a significant factor in the digester's success. He pointed out that batch cooking of Neutracel "involved a temperature rise period of about 3 hours . . . . this penetration time is not a requisite for the attainment of proper cooking. It is simply the minimum time required to bring the batch to cooking temperature." In contrast, the continuous digester "offers the practical possibility of achieving a very rapid temperature rise."

The hydrostatic pressure at bottom of the digester, where chips are introduced, has proven to be a significant factor contributing to the rapid penetration rate. Laboratory cooks attempted to duplicate the continuous digester's rapid penetration and heating characteristics resulted in cooked chips having a high percentage of dark centers. Modification of the laboratory cycle to simulate hydrostatic pressure of the continuous digester penetration cycle by applying nitrogen pressure in the lab digester above liquor level, eliminated the dark centers.

Another factor, possibly the most important, affecting penetration and pulp cleanliness is chip size. Chip length must be below ¾ in. for use in either batch or continuous digesters.

Because of lower yield at increased reaction rate, economic balance between digester capital cost and yield of pulp from wood is an important factor.

Magnefite for Pulp Mills With Odor Problem?

The Magnefite process may be the solution to odor problems for mills producing corrugating medium and bleachable pulp grades from hardwoods. Studies made by Waldorf Paper Co. indicate this possibility The company makes these pulps from aspen at its St. Paul, Minn., neutral sodium sulfite semichemical plant which is surrounded by a populous area.

For semichemical mills operating under these conditions the evaluation of chemical recovery processes warrant "special consideration of the odor level of each process," stated Paul Trout, vice pres.-tech. dir. of Waldorf, who reported on the project at the Alkaline conference.

Dr. Trout said "although the desired pulping conditions were not realized completely" his data indicate: (1) Magnefite process will yield a corrugating medium grade of semichem pulp equivalent to that currently produced by neutral sodium sulfite semichemical process at the St. Paul plant. (2) The Magnefite process produces a bleachable grade of semichem pulp of somewhat lower bleached pulp bursting and tearing resistance than is achieved by normal bleachable neutral sodium sulfite semichemical process. (Dr. Trout attributed this primarily to a greater degree of removal of strength-contributing hemicelluloses by the acid magnesium sulfite process.) (3) Cooking with neutral magnesium sulfite was impractical because of the low solubility of magnesium monosulfite. (4) The extremely corrosive nature of acid magnesium sulfite liquor would necessitate constructing liquor and pulping facilities of acid resistant materials.

Continuous Hypochlorite System Proves Out

Efficient, economical bleach liquor preparation for bleaching kraft pulp, as carried out at Longview Fibre Co., Longview, Wash., was described and evaluated by J.W. Klein, director of technical services of the Longview firm. This paper, co-authored by Mr.

Klein and H. S. Fisher, asst. mgr. of technical services, Pennsalt Chemicals Corp., Tacoma, concerns the plant's previous and present bleach liquor manufacturing systems. The first, installed at Longview Fibre in 1954, was reportedly the original continuous calcium base system to operate in a Pacific Northwest pulp mill and one of the first of this type in the industry.

It involved automatic control of line dilution, manual proportioning of chlorine to lime. Excess lime from chorination was used for buffering the hypochlorite stage.

This system, satisfactory for the purposes for which it was designed, including bleaching of toweling and low brightness wrap, was subsequently further refined and simplified for higher brightness bleaching and better location of facilities.

That the former set-up "got in the way of plant changes and expansion" was a factor in going to the present system. The possibility that impurities left in the bleach liquor would present color reversion problems when bleaching to high brightness was also an influencing factor.

To prevent color reversion and extend brightness capabilities it was decided to use caustic soda for buffering the hypochlorite stage and "produce as clean bleach liquor as possible." Because of the system's good service with so little maintenance and labor, management wanted the rebuilt system to supply all of the mill's bleach liquor requirements and still be operated by regular personnel of the bleach plant.

To achieve these objectives modifications were included in the present system which were not present in the previous installation: (1) A surge tank for diluting lime, which eliminates potential problems from flow variations; (2) "draft tube" design reactor which circulates hypochlorite into incoming streams of chlorine and alkali "by natural means" rather than by pump; (3) a 6 in. DorrClone in flow line, following reaction tower, for cleaning bleach liquor (in lieu of screening as in previous system); (4) Redox measurement for chlorine flow control.

Practicality of the system design, according to Mr. Klein, is borne out by the fact this installation has supplied Longview Fibre's total bleach liquor requirements for three years without major change or repair.

Operational procedure involves keeping the system in production until storage fills to capacity, then shutting down until the reserve reaches low level. This technique is followed because the DorrClone functions best at flow rates above the system's minimum. The start-up "takes only about 5 min. of the bleach plant operator's time and the shut down less." Adjustable production rates could, Mr. Klein stated, "easily have been obtained by recirculating a portion of the product to maintain the DorrClone throughput in the desirable range."

Present equipment for handling rejects from the DorrClone may be changed. Some wastage could be eliminated as the coarse material settles rapidly and leaves a usable solution to be recovered. Following several hours of settling it becomes difficult to disperse the compacted material and get it flowing. At present these rejects are wasted, chemical losses from the system approximating 1.25%.

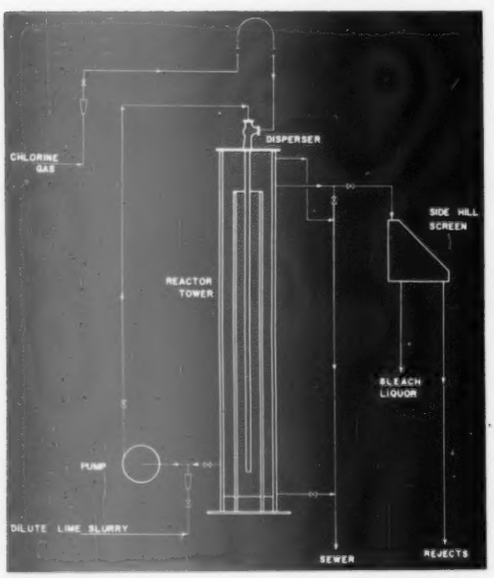
As to scale problems: The system is cleaned about four times a year to rid the pipeline of slow scale build-up. The reactor also receives a precautionary rinse although no scale formation has been apparent. Scale deposits on sensing surfaces of the Redox control are cleaned daily in an acid dip.

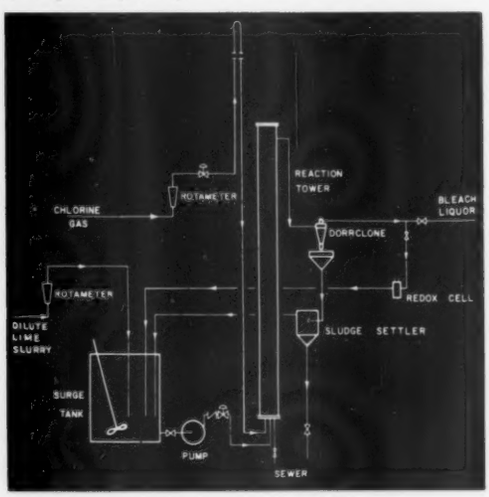
Diagnosing Pulping Deposits

In discussing the elimination of mill deposit problems, R. T. Mashburn, research supervisor of Hercules Powder Co., Kalamazoo, Mich., emphasizes the analysis aspect of such work. This phase materially contributes to successful diagnosis. The rational treatment of problems resulting from mill deposits involves (1) diagnosing the trouble, (2) prescribing treatment, (3) removing the cause.

Mr. Mashburn displayed an analysis outline which has been usefully applied at Hercules laboratories in solving difficulties caused by pulp-paper mill deposits. This systematic analysis outline is as follows:

(1) Boil in water, cool, and check





CONTINUOUS HYPOCHLORITE BLEACH SYSTEM built at Longview Fibre Co. in 1954 (left), served plant needs so well that when expansion-modernization made new bleach liquor system practical only limited changes in plan were incorporated in present system (below).

physical nature. If there is evidence of a hydrophilic binder, stop. It is not of pulp mill origin. If deposit is unchanged, do Step 2.

(2) Check original sample with MCl. If marked effervescence, do Step 3. If no effervescence, do Step 4.

(3) Determine quantitative CO_2. If calculated $CaCO_3$ is over half the sample, stop. Otherwise do Step 4.

(4) Ignite at 900°C. If ash is less than 10%, or more than 10% and $CaCO_3$ accounts for more than half of it, do Step 6. If ash is greater than 10% and $CaCO_3$ accounts for less than half of it, do Step 5.

(5) Determine Al_2O_3 content of ash. If inorganic content is 50%, or more, stop. The deposit is largely inorganic. If less than 50%, do Step 6.

(6) Extract with acidulated alcohol-benzene. Observe physical character of extract. If extractable is less than inorganic content, stop. The deposit is largely inorganic. If greater than the inorganic content, do Step 7.

(7) Determine acid number of extract. If extract is hard and brittle and acid number is excess of 120, stop. Rosin is indicated. If greater than 90%, but not hard and brittle, do Step 8. If less than 50, do Step 9. If between 50 and 90, stop. Extract probably does not contain a single major constituent.

(8) Subject extract to selective esterification. If resin acids are greater than 75% of the acid fraction, rosin is major component. If resin acids are less than 75%, black liquor, defoamer, or a mixture of rosin and defoamer are indicated.

(9) Determine saponification value of extract. If this value is greater than 25, pitch or defoamer is indicated. If the value is less than 25, hydrocarbons such as wax predominate.

Specialty Pulping Gear Extends Lab Scope

The Institute of Paper Chemistry recently acquired two specialty machines which appear to offer possibilities for penetrating present in-laboratory pulping limitations. These special purpose devices were revealed at the Alkaline Pulping meeting by a paper co-authored by Edward F. Thode, John R. Peckham, and Edward J. Daleski, of the Institute's engineering and technology section at Appleton, Wis.

One machine is a "multi-unit digester" consisting of seven ½-liter capacity screw-top cylinders made of 316 stainless supported and revolved at 3 rpm in an oil-bath enclosure. Electric heating elements installed at the bottom and along both long sides of the insulated cabinet heat the oil bath. The side heating elements, connecting directly to the electrical supply, are manually controlled; bottom heating units manually controlled until the bath comes up to cooking temperature. Temperature during the cook is controlled through a Minneapolis-Honeywell Pulse Pyr-O-Vane.

The other pulping unit is an "isothermal" digester, a two-vessel system. Cooking liquor is electrically heated in a prechamber connected to a second vessel by ¾ in. pipe equipped with air-operated quick opening valve. The line between these two vessels connects with a pipe (also equipped with quick-opening valve) to a blow tank.

Prior to starting a cook the closed system is purged and the prechamber charged with previously prepared liquor. While the liquor is being heated in this vessel a special basket is charged with chips and placed in the digester which is subsequently capped and subjected to 30 in. vacuum.

After preheating the liquor to beyond maximum cooking temperature, the cooking reaction is inaugurated by closing the vacuum line and opening the line connecting the two vessels. This line remains open until completing the cook and the liquor is transferred to the blow tank.

Results achieved from these two types of pulping systems were reported in reference to results from a conventional 1.5 cu. ft. stationary vertical digester.

The multi-unit vessel appears to delignify spruce chips by kraft process at a "rate which slightly exceeds" that of either the isothermal or vertical-stationary units. More of the carbohydrate fraction of wood was dissolved at a given degree if delignification in the multi-unit than in either of the other two.

The paper, presented by Dr. Thode, stated "that most of the pulping variables of interest may be explored in either of the two special purpose-digesters with good assurance that the trends found can be validated by replication of the testing in the ordinary, vertical, stationary digesters."

Outside Chip Storage

Considerable discussion has been evoked by a special study prepared by St. Regis Paper Co. and delivered at the Alkaline Pulping Conference on outside chip storage. Because of its importance, Southern Editor W. F. Diehl Jr. reports on it in the Pulpwood Section.

Shold Rogers Payne Klein Fisher

SECOND SESSION moderated by K. M. Shold, Crown Zellerbach Corp., Port Townsend, Wash. Participants included C. E. Rogers, Babcock & Wilcox Co., New York, T. C. Payne, International Paper Co., Moss Point, Miss., J. W. Klein, Longview Fibre Co., Longview, Wash. and H. S. Fisher, Pennsalt Chemicals Corp., Tacoma.

Frost Sanyer Richardson Strapp Trout

SULFITE PULPING GROUP moderated by P. J. Frost, Central Research Dept. of Crown Zellerbach Corp., Camas, Wash. Speakers were N. Sanyer, U.S. Forest Products Laboratory, Madison, Wis., C. A. Richardson, Blandin Paper Co., Grand Rapids, Minn., R. K. Strapp, Sprout Waldron & Co., Ltd., Pt. Claire, Que., and P. E. Trout, Waldorf Paper Products Co., St. Paul, Minn.

T. J. JUDGE, Coordinator of power plant for International Paper's Southern Kraft Division, gives this report on high pressure power.

Jack Judge of International Paper:

"High Pressure Power

● High pressure and temperature in the paper mill power plant does not present undue operating problems. The public utility industry has been using higher pressures and temperatures for years and their operating experiences should be proof that operation and maintenance is not difficult.

Use of high pressure-temperature will pay off, particularly if operating and maintenance personnel are properly trained. Since equipment is better designed and constructed, better operation and maintenance can be expected. Higher cost of repair material is offset by reduced frequency of repairs. Other costs, too, are offset. The cost of training personnel, for instance, is more than paid for by efficiency improvements other than those of electrical generation.

Major differences between high and low pressure systems are in training, new equipment, longer time needed for starting-up and shutting-down and the importance of providing adequate treatment and analysis of boiler water. Let's take a closer look at the requirements.

1. Personnel Must Be Trained

Personnel in high pressure and high temperature plants need detailed knowledge of special operating conditions and equipment care. This is necessary because of the heavier constructed equipment, extra automatic control equipment required, use of more precise safety devices and the necessity of accurately analyzing and maintaining good boiler water conditions.

Operating personnel must better understand methods of warming up equipment and piping during start-up periods, as well as attention required for shutting down. They must study and learn functions of all automatic control equipment and be able to safely switch any operating equipment from automatic to manual control and back.

Maintenance personnel must learn to work with the alloy metals used in high temperature plants. Example: The technique used to weld alloy piping or alloy superheater tubing is much more exacting and precise than for carbon steel. Alloy bolting materials used on high pressure pipe flanges and heavy equipment flanges must be loosened carefully to avoid galling. When tightening the bolts, an exact stress must be applied.

With high pressure and temperature, undue breakage will occur if over-stressed and flange leakage is more prominent with insufficient tension. Welders must be trained to use the latest welding techniques. Repairmen must learn the special instructions for repairing and adjusting the high pressure safety devices, as well as the instruments and automatic controls. Special care and precision must be used to disassemble, inspect, repair or adjust the high pressure equipment.

2. Better Maintenance Essential

Better maintenance programs and practices are absolutely necessary in the high pressure and temperature plants. Good preventive maintenance is of the utmost importance. Making repairs in the high pressure plants is more tedious and exacting than in low pressure ones but, usually, is no more difficult.

Equipment is constructed of heavier materials to provide better safety factors. Also, better materials are more resistent to corrosion and other deteriorating conditions. Boilers use heavier drum plates and thicker tubing; turbines have thick cylinder castings with extremely heavy flanges; piping with heavy wall thickness is welded at most connections and the few flanges used are heavily constructed; valves are equipped with alloy trim and use special packing or seals, which seldom give trouble. All of this high pressure equipment requires more care and more time for disassembly and inspection. Its advantage: Frequency of making repairs is generally less.

Heavier constructed boilers with their more complicated tube arrangement are not as easily cleaned with mechanical devices. Scale is most generally removed with acid solutions, a process requiring special skill. Also, superheater and boiler tubing is generally replaced or repaired by welding on which special welding technique is required.

3. Differences in Equipment Operation

High pressure turbines, because of their heavier construction and precision manufacture, operate very smoothly and with little difficulty. Periodic internal inspection is necessary to determine the condition of buckets, nozzles, seals, etc. in the

A Thumbnail Reference:
How high pressure system differs:

1. Personnel must be more carefully trained.
2. Preventive maintenance is of utmost importance.
3. High pressure equipment operates smoothly with little difficulty.
4. Equipment is more difficult to open for inspection but inspection periods are much farther apart.
5. Extreme care is needed in start-up, shut-down.
6. Time to bring big boiler up to pressure is about four times that of small 400 pounds unit.
7. Well-designed automatic controls are a must.
8. Two-stage demineralization plant provides all qualities required for boiler water.

Poses No Major Difficulties . . ."

steam path. High pressure turbines, being heavier constructed, are more difficult to open up for inspection. Heavy flange bolts must be heated and carefully loosened and time required to reassemble and tighten bolts is much longer. There has been a reduction in the scaling properties that carry over with the steam and deposit in the turbines. Improved operating conditions are such that frequency of internal turbine inspection in better plants has been extended to periods as long as four years.

Boiler feed pumps are also heavily constructed to withstand the high internal pressure and the greater forces exerted by piping expansion. Here also is very little deterioration or erosion of the special alloy materials used. The need for internal inspection is seldom evident. Trouble is apparent only when vibration increases, efficiency falls off or the seals start leaking excessively. All miscellaneous equipment should be kept as near as possible in a condition equivalent to new. It is particularly essential to keep the automatic control equipment, instruments and safety devices in good repair and functioning properly. Good efficiency and economy can be obtained only by keeping them properly adjusted and in continuous operation.

4. Some Operating Problems

Operating problems in the high pressure and temperature plants are little different from those of low pressure. The main difference: Extreme care is required in starting up and shutting down equipment, particularly the boilers and turbines.

To bring a 1200 lb. boiler up to pressure usually requires three or four times longer than a boiler in the 400 lb. range. And in shutting down they must be allowed to cool slowly before the boiler water is drained or before the furnace is entered. These special attentions naturally extend the time required for making inspections and repairs and increase the difficulty of shutting down for short periods, such as on Sunday or a holiday.

Turbines also require more time and diligence for starting-up and shutting-down procedures. Proper heat distribution and expansion must be assured. Turbines designed to operate with temperatures of 950° at the inlet end and 110° at the exhaust, often exhibit vibration spells during start-up. As a unit is shut down, heat from the high temperature end will dissipate into the low temperature end and cause types of distortion different from those in normal operation.

To avoid excessive shaft distortion, the turbine rotor must be kept rolling slowly on the turning gear for several hours after shut down and oil must be circulated for a similar period to remove the heat as it is conducted from heavy castings and forgings to the bearings. These problems present no particular effect if normal operating procedures are followed but when emergencies occur the possibility of damage to the unit increases with the higher temperatures.

5. Automatic Controls Needed

Well-designed automatic control equipment contributes many benefits to convenience of operation. Some plants use central control room areas to coordinate and regulate all operation. Here, one operator can observe all operating conditions and be assured that efficient ratio of fuel and air, constant superheat, necessary steam distribution to hold desired process pressure, correct frequency and a well-divided generator load is maintained. The automatic control equipment must be kept in operation continuously. The operator should never resort to manual control except in cases of emergency.

Because paper mill power plants burn a large variety of fuels different combinations of bark, gas, oil or coal can cause as much as 10% difference in steam temperature at identical boiler loads. To compensate for this variable, the superheater is designed for the worst possible firing conditions. The heating surface is sufficient to obtain design temperature at steam loads of approximately 65 to 75% of boiler rating. A method of attemporation is used to prevent excessive temperature when operating at higher boiler loads or when burning different fuels.

6. Differences in Firing

The principles of firing black liquor are the same for high pressure recovery boilers as for low pressure units. However, the corrosive attack of black liquor furnace gases on metal becomes worse as the metal temperature increases. Recovery boiler superheaters are presently limited to steam temperature of 900° F.

GOOD MAINTENANCE is a must in high pressure system. Latest welding techniques must be used.

One of the most difficult operating problems at this higher temperature occurs when the gas passage becomes partially plugged and more of the gases flow through less restricted sections producing higher steam temperature in those tubes. This causes rapid tube corrosion, which will eventually result in a superheater tube failure. I know of one boiler designed for a steam temperature of 825° F. that had several tube failures because, in a few sections, the temperature was as high as 1000° F.

7. Pure Make-up Required

Since a large portion of the condensate is lost in process steam uses, make-up in the boiler feedwater will usually run between 40 and 60%. A good, pure make-up must be provided for the high pressure boilers. A two-stage demineralization plant provides an excellent effluent with all the qualities required for boiler water. Good well water can usually be treated through the demineralizers without any type of pretreatment or filtering.

In mills where surface water is treated for process use, a portion can usually be filtered and demineralized without further treatment. The plant is very simple to operate and requires practically no attention except when regenerating the exchange bed. The operating cost may seem to be excessively high, but after considering such factors as less internal boiler treatment, less boiler blow-down and reduced carryover with steam, it can be justified.

BETTER OPERATION FROM EQUIPMENT is one of the payoffs in using high pressure system. Turbines, like these at International Paper's Pine Bluff mill, operate smoothly and without difficulty because of heavier construction and precision-build.

OPERATORS SHOULD NEVER RESORT TO MANUAL CONTROL, says author Judge, except in cases of emergency. Use of well-designed automatic controls permits single operator to maintain efficient fuel and air ratio, constant superheat, desired pressure.

8. Water Conditioning Problems

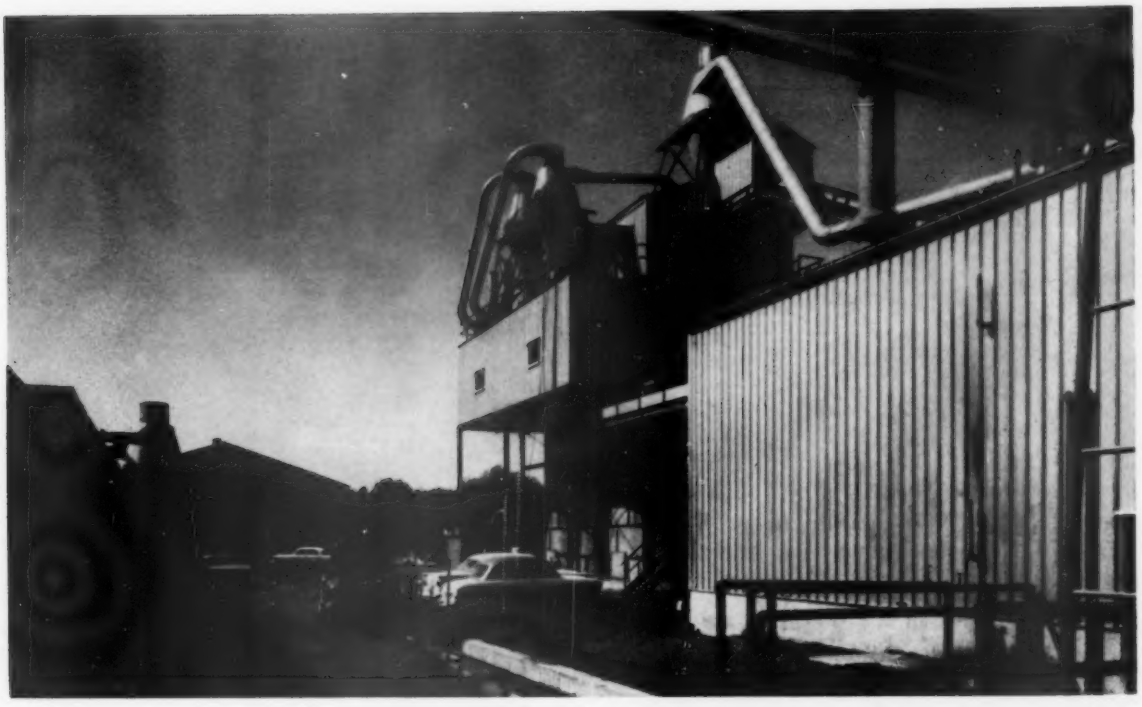
One of the troubles of boiler water conditioning originates in the mill condensate system. Excessive iron oxide is picked up by the condensate, particularly after the mill equipment has been out of service for several days. As the boiler operating pressure is increased, the attack of iron oxide scale on the boiler metal becomes more active. Iron returned with condensate must be kept to an absolute minimum. Oxidation in the condensate system must be reduced as much as possible and the iron picked up should be removed before it enters the boiler. Several methods for reducing iron pick-up are presently being studied.

9. Review of Operating Conditions

In plants designed to produce machine dried pulp, particularly bleached pulp, it is possible to generate all of the electrical power required with process steam. Such plants require use of reducing and desuperheating stations continuously. Other plants, such as those producing groundwood pulp and newsprint, have a high electrical load in relation to the process steam. Many of these plants will produce more than 50% of their power with condensing steam, even using the highest practical pressure and temperature level.

Standards of pressure and temperature have been established by equipment and piping manufacturers and the equipment cost naturally varies according to these. In my opinion, economically grouped, the most practical steam condition pressures and temperatures are: 400 psig, 750° FTT; 600 psig, 750° FTT; 850 psig, 825° FTT; 1250 psig, 900° FTT; 1250 psig, 950° FTT; 1500 psig, 1000° FTT.

Since recovery boiler steam temperature is limited to 900° F., higher temperatures at the turbine inlet can be obtained from power boilers only, or by blending the 900° recovery boiler steam with higher temperature from power boilers.



FLAKE SILOS and flaker building (right) at new MacMillan, Bloedel & Powell River's flakeboard plant at New Westminster, B.C.

Flakeboard Plant "Redesigns" Wood

B.C. plant uses premium quality wood that has been "redesigned" to emphasize its natural qualities and impart new ones

● The $2,500,000 flakeboard plant of MacMillan, Bloedel & Powell River, Ltd., at New Westminster, B.C., now in production, is expected to turn out about 33,000,000 sq. ft. of engineered flakeboard annually, valued at roughly $3,500,000.

Highly automatic, the plant may be regarded as a recovery operation since its raw material is Western red cedar that would otherwise have to be disposed of at much lower unit value.

Plant designers have profited from the experience of other operators in a similar field. According to Colin Henry, manager of the operation, the project was in the study stage for several years before Powell River Co. decided that the right formula and process had been developed and started construction. The flakeboard plant was the first new manufacturing enterprise to be completed following Powel River Co.'s merger with MacMillan & Bloedel. The company's fine paper mill, a first in Western Canada and completed only recently, is the second and it is located within a couple of miles of the flakeboard plant, on Annacis Island, at the mouth of the Fraser River.

The product is practically unique, although it bears a resemblance to what Abitibi Power & Paper Co. is manufacturing at Sturgeon Falls, Ont., and the "cedarwood" produced by Columbia Hardboard Co. in Everett, Wash. However, the processing is different. Flakeboard is regarded by its manufacturers as premium quality wood that has been "redesigned" to emphasize its natural qualities and to impart new qualities. No chips, sawdust, splinter bark or other scrap by-products are used.

Process Flow

The process starts with red cedar, delivered to the plant by truck or barge, fed onto conveyers by front-end loaders, flaked to controlled thickness to retain the natural strength of the wood fiber, and

coated with synthetic resin.

The "engineered flakes" are then formed into mats with all flakes cross-laminated for strength and stability in both directions. Finally, the mats are subjected to heat and pressure until flakes and resin are fused into panels that are then trimmed and sanded on both sides with uniform strength, stability and surface smoothness.

A large proportion of the cedar used in the process originates in the sawmills operated by MB&PR, located "just across the street," although non-company sources are also used. The wood is delivered to the plant in 12 in. blocks, rough cut.

First step is flaking, and the blades of the flaking machine are set to cut flakes to exact thickness for maximum bond strength, warp resistance and screw-holding ability. Flakes and blades are checked at 30 minute intervals to insure uniformity.

Flakes are dried to the moisture content that assures satisfactory combination of fiber resilience and bond strength. This operation is performed automatically in a rotary kiln operating like a giant clothes dryer. The drum rotates gently and drops flakes to the bottom. Moisture content is critical so extremely close control is maintained at this stage.

Before applying the resin, the dry flakes are conveyed to a weighing station, where a reading determines the precise amount of resin and wax solution to be added for bonding, the amount being automatically metered to the spray nozzles, where a solution of urea formaldehyde resin and wax is sprayed, coating each flake.

The resin, of course, is the bonding agent that molds the flakes into a solid, homogeneous panel; the wax surrounds each flake to stabilize moisture content during the remainder of the board-making process.

How Flakes Are "Engineered"

The flakes are then re-formed into panels and are conveyed onto a moving line of interlocking steel plates or "cauls." Spreaders measure out a fixed quantity of flakes onto each caul, forming on each a mat of flakes in a random, crisscross pattern.

It is this cross-lamination of many layers of "engineered" flakes that insures bond strength of the finished panel. After matting, each caul is automatically weighed and measured; those not meeting the standard are rejected.

The mats are then placed in a press by an automatic loading rack. Specially designed for flakeboard production, the press handles up to 20 mats in one operation. Heat is applied during pressing, causing the thermosetting resin to cure and create a strong bond between the individual flakes.

CEDAR BLOCKS ARE "RECOVERED" from sawmilling operations and converted into higher value flakeboard.

A double-end trim saw squares and trues all four edges of each newly pressed panel, and insures that finished flakeboard panels can be butted with no fitting problems. Trimmed boards are then cooled for 24 hours to cure for the final process—surfacing.

Each panel is sanded on both sides to required thickness and is then ready for shipment, although filled grade flakeboard receives one additional operation. A high-quality filler is added to produce an unusually smooth surface suitable for paint finishes or application of thin laminates.

MB&PR plans to sell its flakeboard in ¼ and ⅜ in. thicknesses in Western Canada as far east as Winnipeg and also to the United Kingdom.

Research Stages

One of the men who has been close to the flakeboard program is Dave Harper, of the company's research and development department. He says there are three main types of composition board—hardboard of high density and well known to the trade; softboard, of limited strength; and medium-density board, in which category particle board and flakeboard belong.

Ten years ago a United Kingdom company offered to install a process to create a product akin to flakeboard, but for one reason or another Powell River Co. did not adopt it, and it later became well known as Novaply in the U.S. Several other companies also advanced alternative processing plans. In 1956 Powell River's research department, after studying the experience of others, built a pilot plant with flakers, dryer and forming line. A continuing series of experiments were made to decide the best way to use surplus red cedar. By 1958 the research team reached the point where costs and market prospects came into line and justified commercial production.

"We chose flakeboard rather than particle board because we were looking for strength and all-purpose utility, primarily," says Mr. Harper.

Flakeboard has a variety of uses. It is used as underlay for carpeting and linoleum, for paneling and partitions, doors, cabinets and cupboards, counter tops, furniture and store fixtures. Standard flakeboard panels are likely to be produced in greatest volume in ¾ in. thickness and 4 ft. x 8 ft. sizes. The material is regarded as "a natural" for core stock and for various do-it-yourself projects around the house.

Plant Personnel

C. A. Henry, flakeboard plant manager, is a graduate in forestry of the Univ. of Liverpool and, after war service with the British army, became associated with the United Kingdom's lumber, plywood and wallboard markets. He was sales manager of Noel Legh and Co.'s plywood and wallboard divisions before going to Canada in 1949, where he at first became associated with W. Clare Duffus, Ltd., later going into business for himself under the name C. A. Henry Ltd., Toronto, handling all kinds of building products. Before going to the coast to join Powell River Co. he was vice president and general manager of the Canadian division of Homasote Co. of Trenton, N.J.

Key personnel includes Roger Hughes, production manager; Gunnar Holst, quality control supervisor; A. C. Mullen, project engineer; Dan Wurzen, shift foreman.

Over-all planning of the flakeboard plant was under the direction of Dr. Harry Andrews, vice president, planning and development, and when the project reached the engineering and construction stage it became the responsibility of Harold Moorhead, vice president, engineering, and his staff. Details of design and layout were in the hands of Industrial Development Co., of Tacoma, which has had considerable experience in this field.

Key Equipment Manufacturers

Flaker—Canadian Summer Iron Works, Vancouver, B.C.

Dryer—Standard Steel Corp., Los Angeles, Calif.

Prepress and silos—Vancouver Iron & Engineering Works, Vancouver

Blowers, cyclones, ductwork and feeders—Archer Blower Co., Seattle, Wash., and Mainland Metal Works, Vancouver, prime contractor.

Felter—Canadian Car Pacific Ltd., Vancouver.

Press—Williams-White & Co., Moline, Ill.

Loader—American Manufacturing Co., Tacoma, Wash.

Board cooler—Canadian Sumner Iron Works, Vancouver.

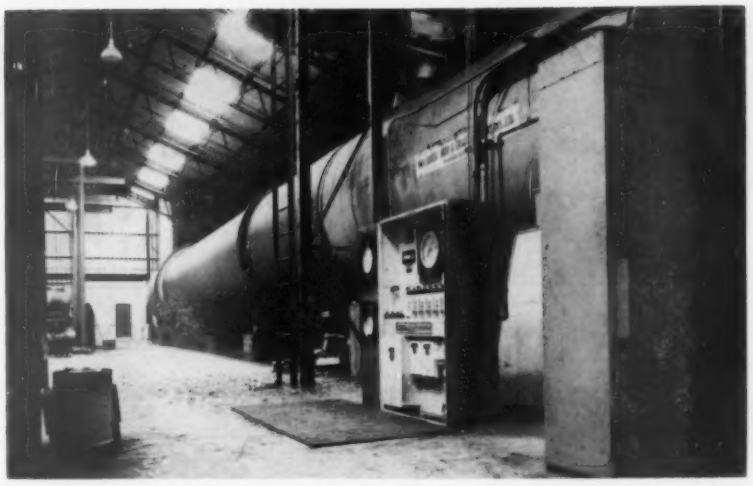
Electronic scarfed edge press—Mann-Russell, Tacoma, Wash.

Trim saws—Kohler-Joa Corp., Sheboygan Falls, Wis.

Unloaders and stackers—Durand Machine Works, New Westminster, B.C.

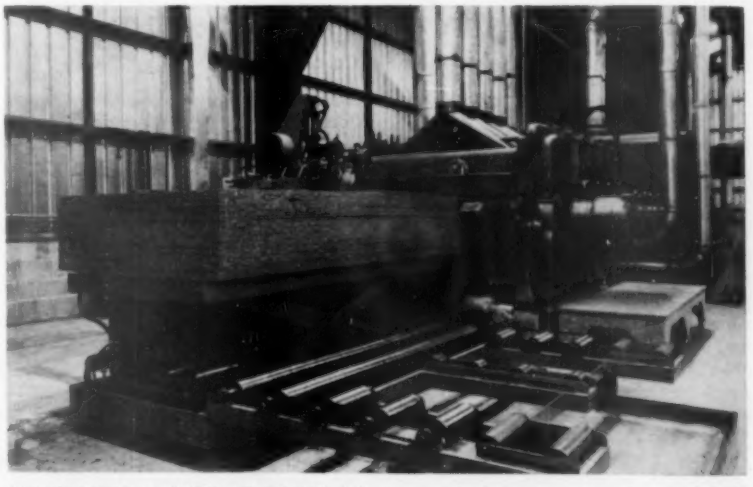
Drum sander—Yates-American Machine Co., Beloit, Wis.

Belt sander—Smithway Machine Co., Seattle.



FLAKES ARE DRIED to proper moisture content in rotary kilns. Giant drums rotate inside the kiln and flakes drop to bottom.

PRODUCTION LINE SHOWS 20-opening press. High-frequency electronic and gluing facilities are at left.



AUTOMATIC PANEL FEEDER injects panels into drum sander and belt sander. Each panel is sanded on both sides before shipment.

Improved Pulp Chlorination

Better pulp chlorination is needed now to increase bleach plant efficiency and to improve product quality

Part I — Operating and Control Study

Next Month: Equipment Design

By E. PAUL DUNCAN*
Technical Service Supervisor
Western Chemical Div.
Hooker Chemical Corp.

and

DR. W. H. RAPSON
Consultant

● One of the best opportunities for improving modern bleach plant operation lies in the chlorination stage. The primary pulp chlorination step definitely needs engineering attention. Not only will efficiency of operation be stepped up, but pulp quality will be improved, chemical costs reduced and safe conditions virtually assured.

The critical nature of the primary stage and its importance have always been known but little has been done recently toward improvement, while the other stages of the bleach plant have received much attention and have been tuned to a relatively high degree of control and dependability.

Three major factors show current need for improvement of pulp chlorination:

(1) For the first time since the advent of chlorine dioxide bleaching, much pulp strength loss can be traced directly to the chlorination stage.

(2) For the first time since the recent successful application of oxidation potential measurement, a dependable means is available for automatic control of chlorine addition.

(3) For the first time, mill data is available that indicate that radical new equipment design will improve quality, safety and general bleach plant economy.

Each of these factors will be considered separately; but, it must be noted that all are inter-related, and all must be considered in order to achieve optimum results.

Quality Losses in Pulp Chlorination

The advent of chlorine dioxide bleaching has almost eliminated the loss in strength that normally accompanies bleaching with hypochlorite. Resulting high-strength kraft pulps with higher brightness were such an improvement over all previous pulps that at first little attention was paid to other sources of strength loss in the bleaching process. Now, however, concern is being shown for the smaller loss in strength that occurs during the chlorination stage. This is relatively small compared with the strength loss occurring during hypochlorite treatment, but it is more significant when bleaching with chlorine dioxide. In fact, chlorination may be the major cause of damage to pulp when hypochlorite is not used at all, as is the case in some bleach plants. This may also be true in those mills where a single control stage of hypochlorite is used in conjunction with two stages of chlorine dioxide.

Effect of Temperature on Viscosity

TAPPI Monograph No. 10 on "The Bleaching of Pulp" states[1]:

"Chlorination at low consistency is usually carried out at the prevailing seasonal temperature of the mill water. During the winter when the mill water is cold, the time required for complete reaction is longer than in summer or early fall when the mill water is warm. To assure uniform results and to avoid heating large volumes of water during the cold season, it is only necessary to design the chlorination capacity sufficiently large to obtain the desired production rate with mill water at its minimum temperature."

This principle has governed the design of chlorination towers in the past, but now it must be challenged. The inherent assumption that chlorination at higher temperatures for the same length of time and with the same amount of chlorine does no harm to the pulp is not justified.

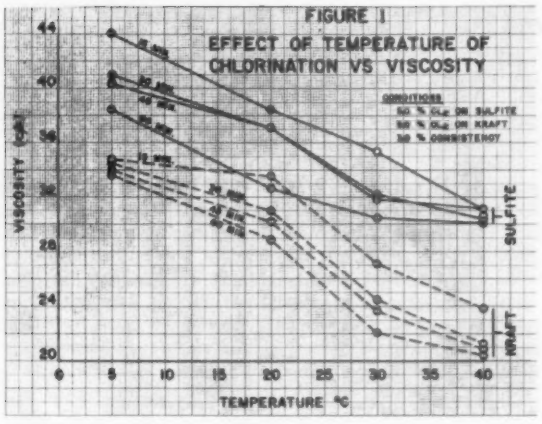
The effect of increasing temperature of chlorination on pulp viscosity for both sulfite and kraft pulps is shown in Fig. 1. It should be noted here that, in all the experiments presented, after chlorination the pulp was treated with 1% sodium hydroxide on pulp at 5% consistency at 50° C for 2 hrs. before analysis. The large drop in viscosity at the higher temperatures indicates that there is considerable loss in strength.

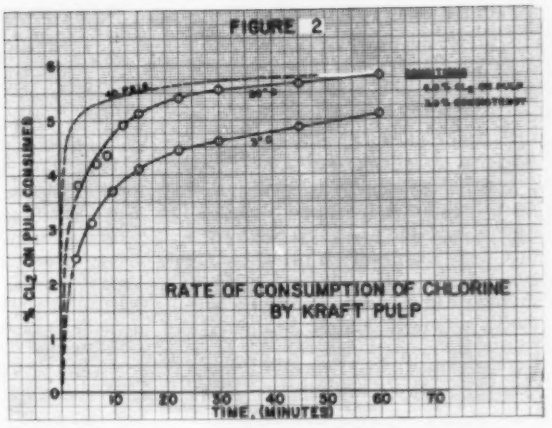
In some northern mills, chlorination temperature varies from 2° C to 30° C throughout the year, while in some southern mills the variation is from 15° C to 40° C, the higher temperature arising from re-use of warm white water. If retention time is optimum at the lower temperature, it must be far too long at the higher temperature, and considerable degradation may be expected.

Temperature and Reaction Time

Since chlorination is an heterogeneous reaction between chlorine in water solution and solid materials contained in pulp fibers, the study of the kinetics of chlorination is difficult and complicated. Some of the reactions are very fast (for example, those with lignin) and are possibly diffusion-controlled. These account for the rapid consumption of a large proportion of the chlorine that a pulp will ultimately take up, with well over half being consumed in less than 3 min. Other reactions are much slower, and chlorine consumption continues at a lower rate indefinitely if an excess is provided. Some of the chlorine consumed at slower rate presumably re-

*Presented at the annual fall meeting, Paper Industry Management Assn., Pacific Coast div., Seattle, Wash.





acts with the less accessible residual lignin, but most of it reacts with carbohydrates, oxidizing and degrading them.

Fig. 2 shows the rate of consumption of chlorine at 20° C and at 3° C on kraft pulp treated with 6% chlorine. The solid curves were plotted for laboratory tests at atmospheric pressure. At 20° C about half the applied chlorine is consumed in the first 3 min. The dotted line is an approximation showing that in some mill operations with ideal mixing under pressures of 25 to 40 psig the chlorine solution rate and distribution are speeded to the point where 70 and 90% of the applied chlorine is consumed in the first 5 min. The pressure is fixed for a given mill by the tower head, but the temperature is not fixed. Fig. 2 shows the expected increased rate of reaction with increasing temperature.

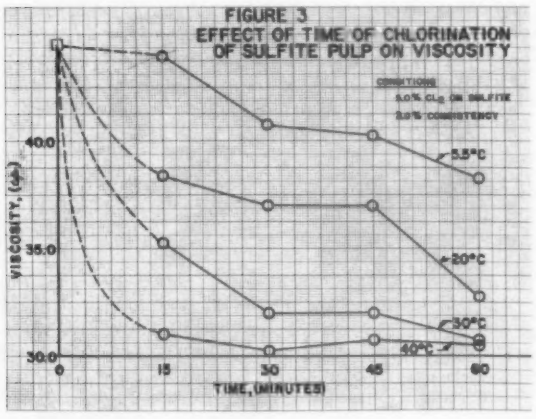
Effect of Time on Viscosity

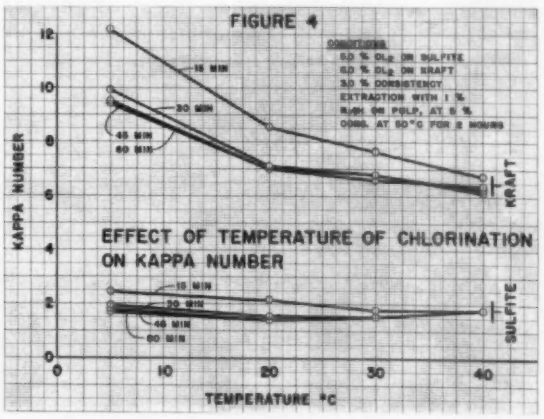
In the first period of 3 to 5 min. most of the chlorine reacts with the lignin, and much of the remaining fraction reacts with carbohydrates. The latter reactions are probably responsible for the strength loss of the treated pulp. Fig. 3 shows the viscosity change with time for a sulfite pulp at four different temperatures. This clearly shows that at the higher temperatures, where the reaction rates are higher, the viscosity drop is highest. It may be seen that the rate of viscosity lowering increases sharply with increasing temperature, and that the time should be drastically shortened at higher temperatures if strength losses are to be kept to a minimum. In fact, probably not more than 15 min. reaction time should be allowed, and temperatures should be held below 10° for good chlorination of sulfite pulp. Although these optimum conditions for sulfite pulp have been known for many years, sulfite chlorination stages are still being designed for 60-min. reaction, and operating temperatures are often around 20° C.

Temperature and KAPPA Number

Fig. 4 shows the effect of temperature of chlorination on KAPPA number at four different times for kraft and sulfite pulps. Assuming that KAPPA number is a measure of residual lignin, it may be seen that for the sulfite pulps (starting at KAPPA No. 22.2) within the limits used, neither time nor temperature has much effect. The number is nearly as low as it will get with 5% chlorine on pulp after 15 min. at 5° C. Therefore, time should be short and temperature as low as possible for chlorination of sulfite pulps to minimize degradation.

Fig. 4 shows that for kraft pulp, it is desirable to hold the temperature close to 20° C for optimum results. This is shown more clearly on Fig. 5, which is a plot of KAPPA number against time, with parameters of temperature. For kraft pulp, the KAPPA number dropped from 33.1 to 12.1 in 15 min. at 5.5° C and to 9.9 at 20° C. Longer time made little difference in the residual lignin content. Raising the temperature to 20° C caused a significant drop in KAPPA number, but higher temperatures had little beneficial effect, probably because nearly all the chlorine was already consumed in the 15 min. period. In fact, as shown previously, beyond the 15 min. time, where the KAPPA curve





starts to flatten out at a minimum, most of the remaining chlorine could be reacting with carbohydrates and could be degrading the pulp. Therefore, again it may be concluded that for kraft pulp temperatures should be kept as near to 20° C as possible, and that if higher temperatures cannot be avoided, time should be drastically shortened to minimize strength degradation as seen in Fig. 3. On the other hand, at temperatures of 5° C or lower, it would be safe to force the chlorination by carrying a high excess, since at the low temperatures the oxidizing reactions apparently do not proceed. In fact, in northern mills with temperatures as low as 3° C in the winter, it should be safe, and necessary, to overchlorinate with a retention time of some 2 hrs. in order to lower the KAPPA number sufficiently.

Time, Temperature and Hot Alkali Solubility

Solubility in 7.14% hot NaOH solution is a measure of the carbonyl group content of pulp. Fig. 6 shows the effect of time and temperature of chlorination on this property. Again, higher temperature increased hot alkali solubility and therefore presumably increased color reversion. By keeping the temperature down to 20° C, hot alkali solubility is kept to a minimum, but at higher temperature the time should be shortened to keep carbonyl groups from forming.

All the above data substantiate and help explain results obtained or suspected in many mills. It is generally known that with optimum chlorination, it should be possible to reduce the caustic extracted KAPPA number to a uniform low figure that would enable the subsequent bleaching stages to be run continuously under fixed conditions. This would be ideal, but changes in brown stock K numbers, varying wood furnish, varying production rates and varying temperatures, all requiring critical control of chlorine treatment, make it impossible to achieve this goal in most, if not all, mills.

It is significant that a recent paper by Virkola, Hentola, Makinen and Soila[2] showed that by suitably varying time with temperature of chlorination of sulfite pulp, very nearly the same brightness, viscosity, beating time, strength characteristics and opacity could be obtained after subsequent caustic extraction and hypochlorite bleaching under fixed conditions. This is based on laboratory data and, as far as is known, has not been tried in mill operations.

Redox Control of Pulp Chlorination

Optimum chlorination with minimum strength loss requires some form of automatic control of chlorine addition to continuously compensate for variations in brown stock entering the bleach plant. For the first time, it is possible to accomplish this through oxidation potential control. The first successful application of redox measurement for automatic control of pulp chlorination was reported by Seymour in 1956.[3] The advantages to be gained with this system are more uniform, optimum chlorination, resulting in easier and more efficient control of subsequent bleaching stages. The over-all bleach plant operation may be improved to the extent that pulp quality is more uniform and chemical waste is minimized. Data verifying this was reported by Bush in 1958.[4]

Redox control was quickly recognized as the possible solution to pulp chlorination control problems, and nearly all bleach plants on the continent have either installed the system or are in the process of doing so. Unfortunately, few mills are realizing all the benefits. Part of this is because of improper installation, and part is due to inadequacy of the chlorination stage equipment. Regardless of the unsatisfactory results, it is significant that any attempt at redox control is worthwhile.

More has been learned about pulp chlorination through redox control than was ever possible through laboratory or mill testing. Redox gives a dependable, continuous, measurement of the reaction, and for the first time continuous records show how poor cooking, inefficient mixing, poor blending, tower channeling, temperature and many other variables affect the chlorination stage. Furthermore, the desire to realize the benefits possible through automatic redox control has given the incentive to study the chlorination stage and take the necessary steps to improve the stage design. All this will lead toward improved pulp chlorination.

All these factors are covered in detail in a recent paper by Duncan, Jack and Schlumberger.[5]

(1) The 3% stock sample take-off

FIGURE 5

EFFECT OF TIME OF CHLORINATION OF KRAFT PULP ON KAPPA NUMBER

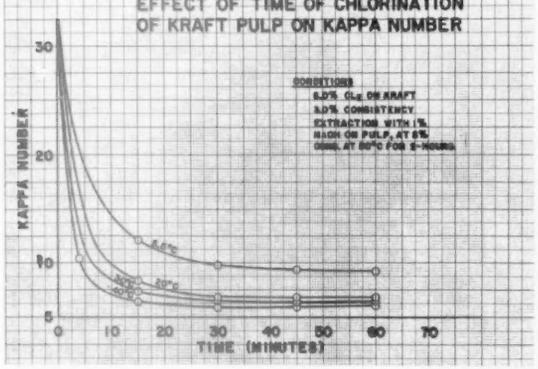
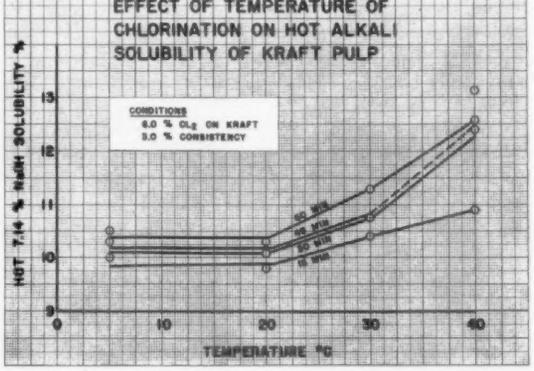


FIGURE 6

EFFECT OF TEMPERATURE OF CHLORINATION ON HOT ALKALI SOLUBILITY OF KRAFT PULP



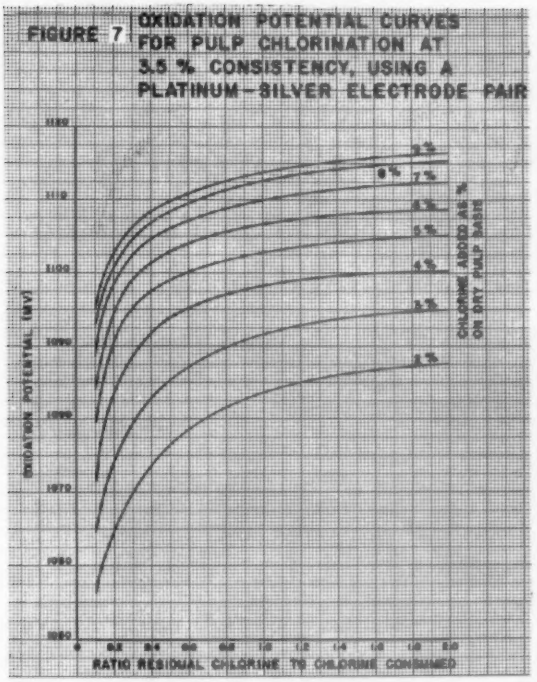
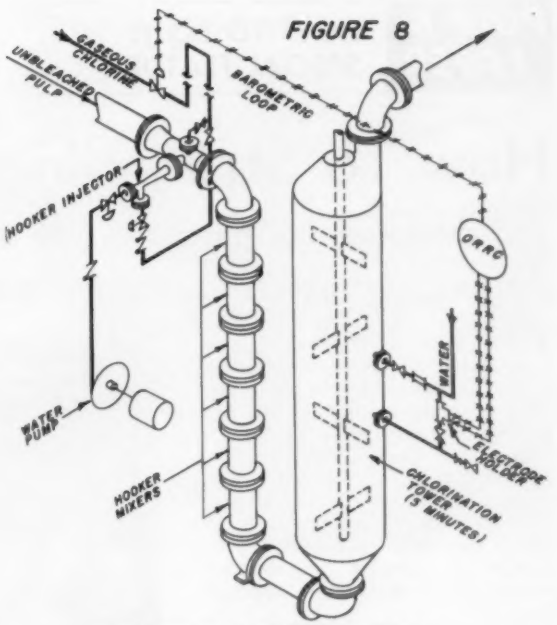


FIGURE 7 OXIDATION POTENTIAL CURVES FOR PULP CHLORINATION AT 3.5 % CONSISTENCY, USING A PLATINUM-SILVER ELECTRODE PAIR
OXIDATION POTENTIAL (MV)
CHLORINE ADDED AS % ON DRY PULP BASIS
RATIO RESIDUAL CHLORINE TO CHLORINE CONSUMED



CHLORINE INJECTOR, MIXER AND REDOX CONTROL

point in any system should be from 1 to 3 min. after chlorine addition. The dilution of 3% chlorinated stock to 1% with cold water essentially stops the chlorination reaction, and subsequent retention time in the dilute sample transfer line to the electrode cup is insignificant.

(2) The hypochlorous acid (HOCl) present due to hydrolysis of chlorine in water apparently has a significant effect on the oxidation-reduction potential and may give misleading and erratic readings. The HOCl concentration is depressed by the formation of HCl as the pulp chlorination reaction proceeds, and desired correlation of the ratio of unreacted chlorine to reacted chlorine with the redox potential apparently can be obtained only if the reaction is permitted to continue for 1 to 3 min. For most pulps with good mixing, the chlorination reaction is fast enough that 70 to 90% of the applied chlorine is reacted after about 3 min., and after this reaction time sufficient HCl is present to minimize the HOCl effect. At this point, a correct ratio or potential is available for control purposes. Data show that the ratio should be 0.2 or less, in order to obtain good sensitivity and allow maximum possible correction for changes in K number. Ratios in this low range will give wide changes in potential for slight changes in ratio, which is desirable for good control (Fig. 7).

(3) There is evidence that a more dependable, sensitive potential can be measured in 3% chlorinated stock after the appropriate 1- to 3-min. retention than if the sample is diluted prior to measurement. This is particularly true for sulfite pulps.

(4) If potential measurement is made after dilution of the stock sample, it is necessary to accurately proportion the dilution water flow to sample flow. Although cold water dilution stops the chlorination reaction and apparently fixes the true ratio of unreacted to reacted chlorine, the water dilution shifts the equilibrium toward formation of HOCl and chloride ion. This changes the ratio of chlorine to chloride and drops the potential. The phenomena has been observed in mills through measurement of potential before and after dilution.

These factors are vital to proper control, and simple, inexpensive changes to most existing systems will correct for these factors. However, the most significant factor is representative sampling, and this is not easily compensated for. This is a function of chlorination stage equipment, and any necessary changes must be carefully considered because of the possible high costs involved.

Experience with redox at many different mills indicates that probably no two redox control systems are alike in design or results. This is due to many local factors, but probably the degree of mixing of chlorine with pulp and tower channeling are primarily responsible for these differences, and these factors most seriously affect representative sampling.

Assuming the best mixing of chlorine and pulp prior to sample measurement, the system shown in Fig. 8 is recommended for optimum results. This gives retention of 2 to 3 min. with a low ratio and no dilution. The measured signal reflects a true picture of the extent of reaction; and KAPPA number changes, consistency changes and production rate variations will have a minimum affect on the control. This should give the best chance to control to a uniform, low, caustic-extracted KAPPA number.

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2. Virkola, N. E.; Hentola, Y.; Makinen, M., and Soila, R. *Svensk Papperstidning* 62, 477, 1959.
3. Seymour, George W. "Oxidation Potential Control of Pulp Chlorination," *Tappi*, 40, No. 6 (426-28), June 1957.
4. Bush, W. H. "Automatic Control of Pulp Chlorination with an ORP Meter," *Pulp and Paper Magazine of Canada*, Convention issue, 1958.
5. Duncan, E. P.; Jack, W. Q., and Schlumberger, A. A. "Application of Redox Control to Pulp Chlorination," paper presented at meeting of Pacific Coast Branch, Technical Section, CPPA, Qualicum Bech, B.C., Nov. 19, 1959.

How To Streamline Waste Handling

Self-dumping hoppers are one answer says Scott Paper's Winslow division and points to reduced labor costs, improved safety.

• The Northeast Division plant of Scott Paper Company at Winslow, Maine, has streamlined its waste handling program by using equipment tailor-made for the job.

Success of Scott's waste handling method is largely due to two factors:

Extensive use of self-dumping hoppers which can be serviced easily by mobile equipment;

A regular schedule and check-off system for systematically emptying hoppers.

The schedule for servicing hoppers has been made flexible enough, however, to permit extra hoppers to be placed and serviced in areas where special waste loads may occur.

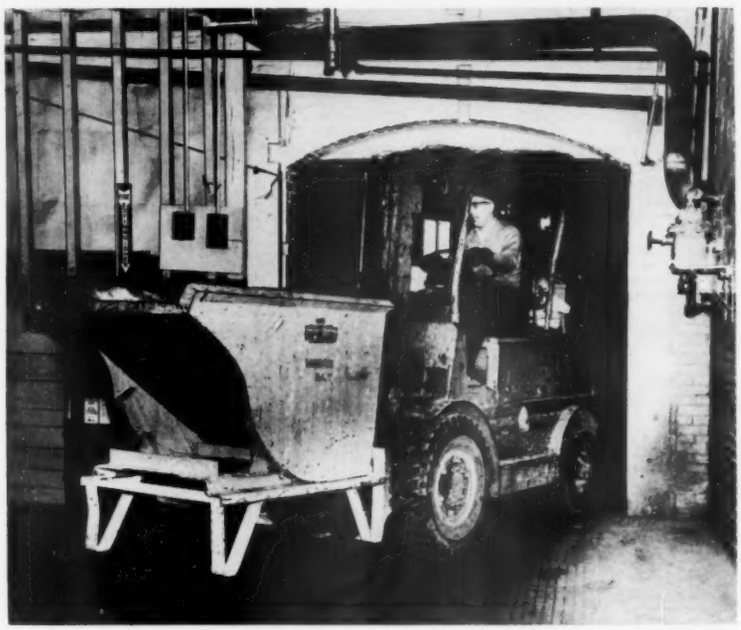
Before installing hoppers, barrels and boxes were used to handle broke, used cartons, floor sweepings, steel strapping and other rubbish accumulated around the plant. The capacity of some of these containers was not always adequate and frequent emptying was necessary. Containers had to be upended manually for dumping, sometimes requiring two or three men to handle them. From a safety standpoint, this method was undesirable because manual handling invited accidents.

To improve the overall efficiency and safety of the waste handling operation, Scott Paper replaced the containers with 14 self-dumping hoppers, six of two cubic yards capacity and eight of one cubic yard size.

Plant maintenance and service crews found that these hoppers, made by Roura Iron Works, Inc., Detroit, could be emptied faster and safer than conventional containers because of their self-dumping action and because they were specifically designed for handling by fork lift or platform trucks.

Handling hoppers with mobile equipment is simple because the units have skids for handling by fork trucks or a combination skid for either fork lift or platform truck handling, depending on the type of trucks used in an area.

Through a study of the plant's waste handling needs, the supervisor of the buildings and grounds department developed a plan for positioning hoppers where most waste accumulated. Depending upon the waste load at various areas, hoppers are regularly emptied according to a printed schedule and check-off sheet for mobile equipment operators.



SELF-DUMPING HOPPERS are used for waste collection and disposal by Scott Paper Co. at its Northeast Division plant, Winslow, Maine. Fourteen hoppers are used, some have fork truck skids, others have a combination skid for fork lift or platform truck handling such as hopper shown in this picture.

The schedule sheet contains a column to be checked when an area has been serviced and provides spaces for recording number of loads, job number and hours. After each shift, operators turn in their sheets to the supervisor's office.

Hoppers are handled by fork trucks assigned to the buildings and ground department. Where possible, hoppers are placed so they can be picked up by mobile equipment. In areas too confined for this equipment to operate, hoppers are placed nearby. Smaller containers are placed in the confined area and are dumped into the hopper at frequent intervals.

Hoppers are also used for trash pick-up from containers spotted in areas where the amount of trash accumulated does not justify a hopper. A fork truck carries a hopper on a route through the buildings, stopping for trash pick-up at such places as the lunch room, main office, first aid room, main gate and employe club house.

When the schedule calls for emptying a hopper, a fork truck quickly picks it up and takes it to a dump truck in the plant yard. The fork truck operator positions the Roura hopper over the truck and trips a release latch on the rear of the hopper, permitting it to automatically dump and rock back to an upright position, automatically locking. Then the hopper is lowered and returned to its designated department or area.

How To Load and Unload Paper Without Spoilage

The problem of loading and unloading paper without spoilage has been solved by Strathmore Paper Co.'s central warehouse, Westfield, Mass., with five retractable loading dock enclosures covered with waterproof neoprene-coated nylon material.

These tailor-made enclosures for trucks were suggested about a year ago by United Canvas Co., West Springfield, Mass. For railroad loading docks of another local company, the company had built similar enclosures, which had proved successful in use.

Because the enclosures are tailor-made, they fit snugly around the rear opening of the trucks. Spoilage of paper through weather is thereby practically eliminated, according to Strathmore's warehouse manager. An additional advantage is the reduction in heating costs, since the enclosures prevent the heat from escaping to the outside air. Instead, some of the heat is guided into the trucks, making it more comfortable to work inside the trucks during cold weather.

The enclosures are constructed strong enough to withstand heavy loads of snow and much rough handling. The supporting frame is made of 1-in. heavy galvanized pipe. Sturdy scissor-like arms are provided to extend and retract the enclosures. The arms are secured firmly to the warehouse wall by means of metal bars embedded in the brickwork. A heavy fabric was chosen, 16-oz. Coverlight-N, supplied by Vulcan Rubber Products Div. of Reeves Brothers, Inc.

After more than one year's service, the enclosures show no sign of wear or tear, says the warehouse manager.

RETRACTABLE DOCK ENCLOSURE protects paper from the weather at Strathmore Paper Co.'s warehouse. Special neoprene-coated nylon is used.

New Black-Clawson Research Center

Construction of a pulping and papermaking research and development laboratory has been completed by Black-Clawson Co. at Middletown, Ohio. The new Research Center is on the site of the Shartle div.

Included are: (1) Complete wet and dry testing stock preparation laboratories and pilot plant, expanded and moved from the original Fulton, N.Y. location; (2) a new Pandia Chem Preg cold soda pulping system pilot plant, and (3) special equipment for testing new papermaking techniques.

Said President Frank T. Peterson at the opening ceremonies: "Technological advancements—so important to us and to the industry we serve—do not materialize out of thin air. . . . This building and equipment give our development engineers an increased opportunity of advancing Black-Clawson technology in step with the growing needs of the pulp & paper industry."

R&D Organization

The new center is operated by the Research & Development dept. under Joe Baxter Jr., research director. Director of the Middletown facility is H. P. Espenmiller.

In addition to development work in pulping and stock preparation for the Pandia and Shartle divisions, the center carries out certain research projects for the Paper Machine div., Watertown, N.Y. Black-Clawson also maintains a paper coating and converting and plastics equipment lab at the Dilts div., Fulton, N.Y., and a semi-commercial pilot Pandia continuous pulp mill in Berlin, N.H., in cooperation with Brown Co.

INSPECTING WORK ORDER NO. 1000—a problem in repulping extra tough wet-strength broke—at the new Black-Clawson lab are (l to r) C. H. Eisenmenger, vice pres., and D. G. Driscoll, president of Sorg Paper; D. H. Montville, vice pres. of Black-Clawson, and H. P. Espenmiller, lab director.

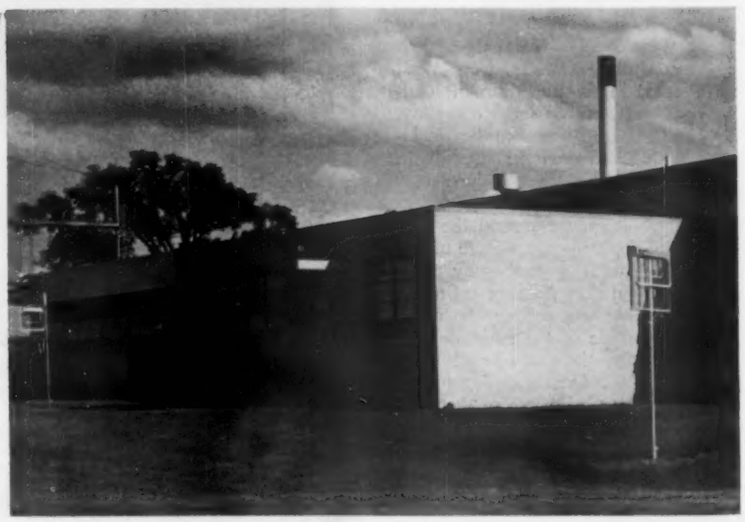
Mills Combat Insect Problem

"Black light" device attracts and kills bugs; units at 125-ft. intervals around plant said to mean dollars-and-cents savings

● With industry showing increased interest in the insect problem, pulp and paper has a two-barreled reason for finding an effective solution.

There is the obvious dollars-and-cents savings. Then, too—especially in the big Southern mills—new and more stringent Food & Drug Administration regulations may well crack down stringently on even the most minor contaminants in foodboards and the like.

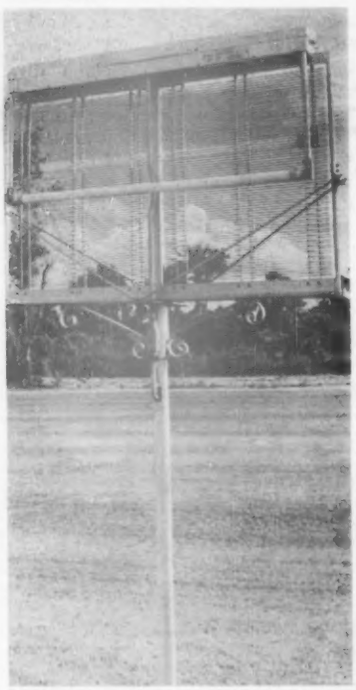
In pulp and paper mills working night shifts, insects, particularly gnats, are attracted by exterior and interior lighting. They are attracted by casein and other coating materials. By becoming imbedded in wet coating, they seriously affect the quality of the paper being produced and are often responsible for material (and dollars-and-cents) losses.



PLANT PROTECTION FROM BUGS is shown in typical installation, with death-dealing units placed at regular intervals around building.

Electronics in the Battle

Now being tested on a wide basis in the paper industry is a near ultraviolet unit called Insect-O-Cutor. A filtered black light source attracts the insects, which are killed on contact with electrified grids.



DEATH TO INSECTS is this Insect-O-Cutor similar to units installed in many U.S. paper mills. Bugs are attracted by black light, killed by electrified wires.

At Rex Paper Co., Kalamazoo, Mich., Insect-O-Cutors have been placed at intervals around the mill. The units are rectangular metallic devices, rather thin and set on standards about 8 ft. above the ground. "Black light," popular name for the electric glow, is invisible to humans except when displayed in quite dark surroundings.

The units are said to be safe for humans, current consumption is small (about 90 watts), and the black light fluorescent tubes have a life of about 7,000 hours.

Electronic insect executioners are the culmination of scientific research and experiments carried on for many years by Dr. William Allen Pohlman, agronomist-engineer, with the cooperation of the U.S. Dept. of Agriculture, General Electric Co. and Gardner International Corp. of Pompano Beach, Fla. The latter firm manufactures and distributes the units.

Paper Industry Installations

Among pulp and paper mills that have installed the Insect-O-Cutor are: Riegel Paper Corp. (four plants); the Peter K. Schweitzer div., Kimberly-Clark Corp., New Jersey; International Paper Co. in Arkansas; Marathon div., American Can Co.; Badger Paper Mills Inc., Peshtigo, Wis.; Milprint Inc., Milwaukee, Wis.; Rex Paper Co., Kalamazoo, Mich.; C. H. Dexter & Sons Inc., Windsor Locks, Conn.; Chemical Fine Paper & Board div., Standard Packaging Corp., Holyoke, Mass.; Continental Can Co., Inc., Middletown, Ohio; Falls Paper & Power Co., Oconto Falls, Wis.; Lowe Paper Co., Ridgefield, N. J.; R-W Paper Co., Longview, Wash.; Watervliet Paper Co., Watervliet, Mich., and St. Francisville Paper Co., St. Francisville, La.

Correction:

On page 80, PULP & PAPER, Sept., in Eugene Cooney's article, "Why There is an Export Problem," the wrong figures for 47 lb. linerboard were used. As corrected the statement should read:

"Before the July 1 deadline the U.S. and Swedish net prices plus duty for 47 lb. linerboard was about $153.52 (U.S.) and $152.24 (Swedish). On July 1, as a result of the 20% reduction in duty under EFTA, the difference increased to about $5.27/ton."

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	APPLICATION			CLA	
	Beater	Calender	Coating	Basic	Acid	Direct
YELLOW						
Auramine	•	•		•		
Brilliant Pure Yellow	•				•	
Chinoline Yellow	•	•	•		•	
Chrome Yellow	•		•			
Chrysophenine	•					•
Direct Yellows	•		•			•
Fast Light Yellow		•	•		•	
Fastusol® Yellows	•		•			•
Hansa® Yellow	•		•			
Metanil Yellow	•	•			•	
Oxide Yellow	•		•			
Paper Yellow	•					•
Permagen® Yellow	•		•			
Stilbene Yellows	•					•
Tartrazine		•			•	
ORANGE						
Acid Orange	•	•	•		•	
Benzo Fast Oranges	•		•			•
Chrysoidines	•			•		
Direct Fast Oranges	•		•			•
Fast Light Orange		•			•	
Fastusol Oranges	•		•			•
Orange	•	•	•		•	
Permanent Orange	•		•			
Paper Orange	•					•
BROWN						
Benzo Brown	•					•
Bismarck Browns	•		•			•
Fastusol Browns	•		•			•
RED						
Benzo Bordeaux	•					•
Benzo Fast Scarlets	•		•			•
Benzo Rhoduline® Red	•		•			•
Brilliant Croceine	•	•	•		•	
Direct Pink	•					•
Direct Reds	•					•
Fast Red	•				•	
Fastusol Pink	•		•			•
Fastusol Reds	•		•			•
Fastusol Scarlet	•		•			•
Magenta	•	•	•	•		
Oxide Red	•		•			
Paper Red	•				•	
Paper Scarlets	•					•
Permagen Red	•		•			
Permanent Carmine	•		•			
Rhodamines	•	•	•	•		
Safranine	•	•	•	•		
Solar® Pink	•		•			
Solcarbo® Pink	•		•			•

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	APPLICATION			CLASS			
	Beater	Calender	Coating	Basic	Acid	Direct	Pigment
VIOLET							
Brilliant Benzo Violet	•					•	
Crystal Violet	•	•		•			
Ethyl Violet	•	•		•			
Fastusol Violets	•					•	
Formyl Violet	•	•			•		
Methyl Violet	•	•		•			
Solar Coating Violet			•				•
Solar Violet	•		•				•
BLUE							
Benzo Azurine	•		•			•	
Benzo Blues	•		•			•	
Benzo Sky Blue	•		•			•	
Brilliant Benzo Blue	•		•			•	
Brilliant Wool Blue		•			•		
Fast Bond® Blues	•				•		
Fastusol Blue	•		•			•	
Fastusol Turquoise Blue	•		•			•	
Heliogen® Blues	•		•				•
Methylene Blue	•	•	•	•			
Neptune® Blues		•	•		•		
Paper Pure Blue	•	•	•	•			
Rhoduline Blues	•	•		•			
Solar Blues	•		•				•
Solar Coating Blue			•				•
Solcarbo Blues	•		•			•	
Soluble Blues	•				•		•
Victoria Blue	•	•	•	•			
Victoria Pure Blue	•	•	•	•			
GREEN							
Benzo Greens	•					•	
Brilliant Green	•	•	•	•			
Fast Bond Green	•				•		
Fastusol Greens	•					•	
Guinea Green	•	•	•		•		
Heliogen Greens	•		•				•
Heliogen Viridines	•		•				•
Naphthol Green		•	•		•		
Neptune Green	•	•	•		•		
Pigment Green	•		•				•
Solar Green	•		•				•
Victoria Green	•	•	•	•			
BLACK							
Acid Black		•			•		
Basic Black	•	•		•			
Diamine Black	•		•			•	
Diazo Black	•		•			•	
Direct Deep Black	•		•			•	
Fastusol Greys	•		•			•	
Naphthylamine Black	•	•	•		•		
Nigrosines	•		•			•	
Permanent Black	•		•				•

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Sales and Earnings – First Half 1960

Representative Pulp and Paper Companies

	Net Sales (000)	Income Bef. Taxes (000)	% of Sales	Net Income (000)	Net Per Share
MARKET PULP (Also Lumber, etc.)					
Brown Co. (11/30)	$ 32,558	$ 634	1.9	$ 380	$0.14
Georgia Pacific Corp.	102,477	n.a.	—	8,446	1.49
Puget Sound Pulp & Timber	17,406	4,936	28.4	2,370	0.91
Rayonier, Inc.	69,598	n.a.	—	5,860	1.03
Weyerhaeuser Co.	225,617	45,318	20.1	28,108	0.94
NORTHERN INTEGRATED COS.					
Abitibi Power & Paper	71,168	12,699	17.8	6,054	1.40
Consol. Water Power & Paper	44,559	8,830	19.8	3,982	1.56
Diamond National	111,467	n.a.	—	6,815	1.45
Fibreboard Paper	54,636	2,536	4.6	1,285	0.73
Glatfelter, P.H.	13,472	2,811	20.9	1,266	1.75
Great Northern Paper	27,874	2,175	7.8	1,222	1.18
Hammermill Paper	30,961	3,160	10.2	1,636	1.28
Oxford Paper	38,765	3,916	10.1	1,656	1.39
Warren, S.D.	38,742	6,029	15.6	2,858	1.33
INTEGRATED—NORTH & SOUTH					
Champion Paper & Fibre (yr. 3/31 4th & 1st Qtr.)	103,740	n.a.	—	4,216	0.78
Container Corp.	158,127	20,264	12.8	9,896	0.92
Crown Zellerbach Corp.	275,737	38,938	14.1	20,295	1.42
International Paper	519,062	74,512	14.4	37,906	2.81
Kimberly Clark (yr. 4/30 3rd & 4th Qtr.)	211,155	36,410	17.2	17,760	1.96
Mead Corp.	157,030	13,431	8.6	6,484	1.26
Riegel	40,035	3,295	8.2	1,533	1.10
St. Regis	248,027	21,823	8.8	11,756	1.20
Scott Paper	157,864	27,111	17.2	13,402	1.66
Union Bag-Camp Paper	111,166	21,533	19.4	10,218	1.31
West Va. Pulp & Paper (10/31)	120,586	11,671	9.7	6,011	1.13
NON-INTEGRATED PAPER COS.					
American Writing Paper	7,837	686	8.8	329	1.22
CONVERTER					
Dennison Mfg.	19,246	1,562	8.1	801	0.60

n.a.—not available

The sales and earnings for the first half of 1960 were especially prepared for PULP & PAPER by Cyrus J. Lawrence & Sons, members New York Stock Exchange, from statistical services and published reports. While the figures are believed to be correct, no guaranty is given as to their accuracy.

Lawson Turcotte Foresees Increasing Pulp Consumption

Lawson Turcotte, president of Puget Sound Pulp & Timber Co., and also of Ketchikan Pulp Co. (Alaska), has issued an optimistic report of increasing pulp consumption in America, based upon U.S. Pulp Producers Assn. data.

He also states that the merger of the Hopper Paper Co. into Puget Pulp "is expected in the years to come to mean the Hopper division will greatly increase its use of Puget pulps." Hopper has one paper mill in Illinois and two in Pennsylvania making fine offset, writing, envelope, cover and specialty papers.

The Bellingham (Puget) mill operated at 478 tons a day in the first half of 1960, compared to 406 tons a day in the first half of 1959, increasing sales by $1,222,000 and also earnings. But due to lower selling prices for dissolving pulps, the Ketchikan sales were down about $1,000,000 and also earnings were down.

Regarding the general outlook in United States, Mr. Turcotte said: "A moderate increase in production and use of woodpulp during the first five months of the present year (which is fairly well distributed over the various grades of pulp) appears to be forging another new U.S. record.

"Imports of pulp to the American market are slackening a bit, but are not materially below last year's arrivals. Export of American-made pulp, on the other hand, is nearly double what it was a year ago.

"Pulp production in United States mills, all grades combined, totaled about 10,735,000 tons in the first five months of 1960, compared to 10,026,000 tons in the like period of 1959.

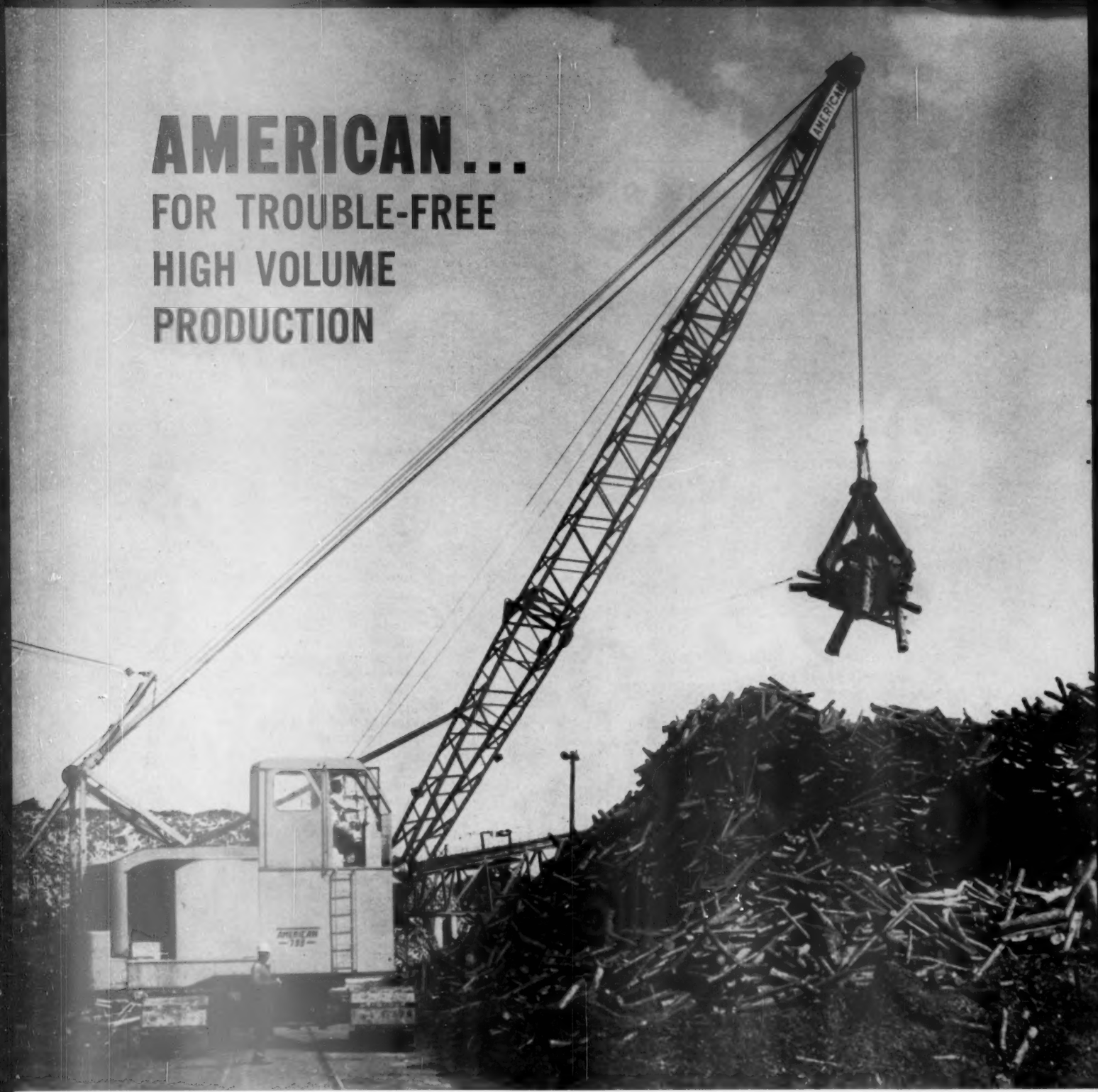
"Five months' imports totaled approximately 970,000 tons this year, against 986,000 tons last year.

"Exports by American manufacturers rose to 424,000 tons in the first five months of 1960, from 223,000 tons in the same months of 1959.

"Domestic new supply of all grades of pulp totaled approximately 11,281,000 tons in the five months, January-May, 1960, against 10,789,000 in those months of 1959. Since recent inventory changes are immaterial, domestic new supply is practically synonymous with current consumption."

Mexican Pulp Production

Word has been received from PULP & PAPER's editor in Mexico City that there was an error in the mechanical pulp production figures given in the 1960 World Review Number of this magazine. The production of the new Tuxtepec newsprint mill in Mexico, which produced 18,000 short tons of newsprint in 1959, was not taken into account. This mill also produced about 14,000 tons of mechanical pulp or groundwood, and therefore the total figure for mechanical pulp production in Mexico should be approximately 50,000 tons, instead of the 36,000 tons shown. The Tuxtepec mill is the first newsprint mill of modern times to be built in Mexico.



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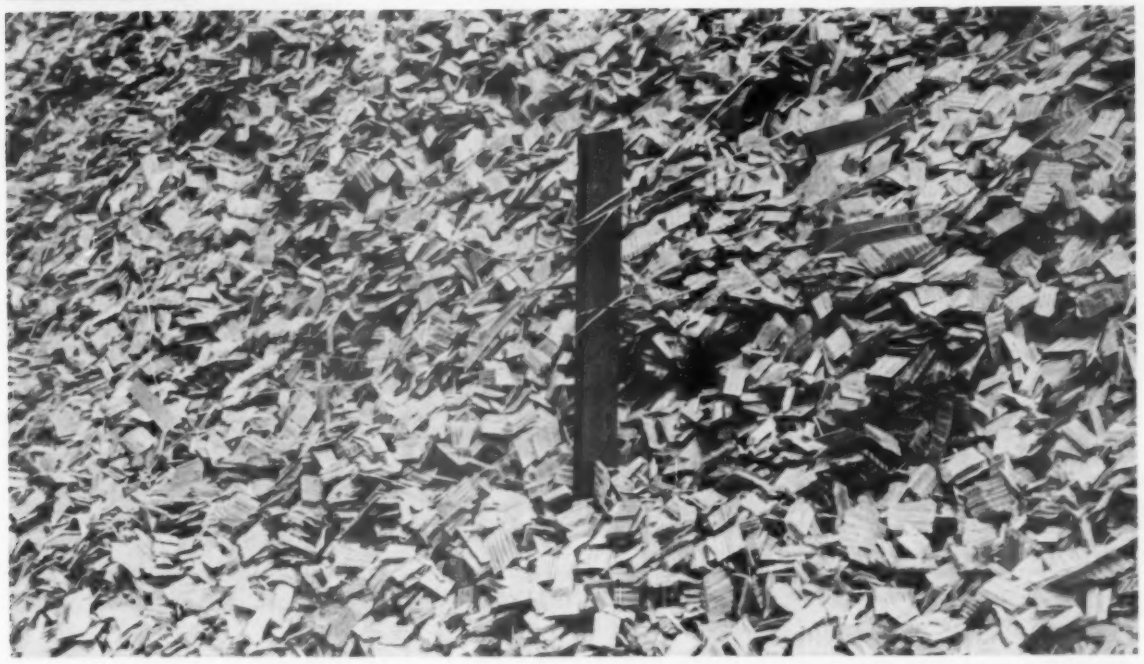


TAGGED TO SHOW LOCATION IN TEST CHIP PILE, thermocouples are connected with a calibrated potentiometer at Fargo, Ga. study site.

Is Outside Chip Storage Practical in the South?

St. Regis report says "Yes!"—Here are some of the reasons why

By William F. Diehl, Jr.
Southern Editor
PULP & PAPER

● The theory of outside chip storage has been bandied around in the South for almost two years. It has its champions – and its critics, both of whom have had their points to score for and against. For the most part, Southerners preferred to hold their judgment because actual knowledge concerning outside storage of chips has been sketchy at best and the small amount of published material on it has been mostly inadequately supported by data.

There is good reason why some progressive woodlands managers and engineers are looking to outside chip storage for salvation these days. There has been increasing pressure from management to streamline methods and shave costs. The reason is economic: The last frontier for cutting pulp costs is in the woods. Of all paper mill operations, wood procurement is perhaps in the toughest position. It must supply a continuous stream of raw materials regardless of weather, season or budget. With labor costs and stumpage on the rise, the challenge is a most demanding one. And now added to that is a third variable, pulp quality. Of late, more and more stress is being put on quality.

Because of this, quality-minded managers are beginning to focus a more jaundiced eye at the woodyard, historically the one safety valve the procurement people have since it is a place to store wood and save it for a rainy day.

Carefully researched studies of the effects of deterioration in the yard have been made by several companies, notably Crown Zellerbach at Bogalusa, La., Brunswick Pulp and Paper, Crossett Paper Mills, West Virginia Pulp and Paper, and St. Regis Paper Co.

The effects on long-stored wood are well understood. At Crossett a report by Kenneth Chestley, James Hair and J. N. Swartz indicated that pulpwood stored for six months in the yard lost 7% in wood density and the percent yield was further reduced another 6%. Tear was off about 25% and burst another 25%. One accepted way to offset such losses has been underwater storage, pioneered at Crossett and used effectively now at Bowaters Southern Paper Corp., International Paper's mills and others.

Possibly the most important new concept in wood procurement in the South is the use of purchased wood chips. It has not only caught on but has grown in use to a point where 25% of the wood used in the South today arrives in chip form. This has now levelled off. Reason: Equipment to store chips is costly.

The practice of storing chips outside has been used on the West Coast for years and was first nationally publicized in an article by Western Editor Lou Blackerby in the October 1959 PULP & PAPER. If there has been any concern over deterioration of stored chips, West Coast mills do not seem overly concerned with it. But one Southern woodlands engineer told PULP & PAPER: "It has been generally believed that chips would suffer serious deterioration after about one month."

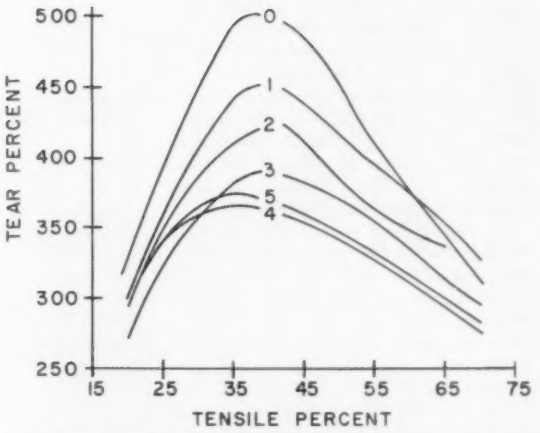
Based on the potential of outside storage, St. Regis Paper Co. in June 1959, constructed a test chip pile at its Fargo, Ga., woodlands station. It was assisted in its research by W. R. Smith, Chief of Forest Utilization Research at the U.S. Southeastern Forest Experiment Station in Asheville, N.C., and by R. M. Lindgren, chief of the Forest Products Laboratory's Wood Preservation Division. The results of this research seem certain to open up widespread use of outside chip storage in the South. The report was made public by St. Regis' C. W. Rothrock, Jr., regional supervisor of the pulping department at Pensacola, Fla., at the 1960 TAPPI Alkaline Pulping Conference.

Advantages

Potential of outside chip storage is broad. Better wood measurement is possible. Handling costs are lower. It enables establishment of chip mills at the wood source, a long-range theory expounded by woods leaders. It permits stabilization of chipping and woodyard operation and, probably most important of all, presents a solution for storage problems arising from increased use of this valuable raw material source. Wood chips, reports St. Regis, are more easily measured than roundwood and the measurements are more reliable. Furthermore it is easier to determine the efficiency of the pulping process.

Another attractive aspect to outside chip storage is the role it can play in developing hardwood utilization. Levels have not yet been reached where separate fulltime hardwood operation is feasible but levels have been reached where separate intermittent production is required. The costly problem of storing two kinds of wood

HOW CHIPS WERE STUDIED is shown in these pictures taken by the U. S. Forest Service at time pile was set-up. At right, 100 by 50 ft. area is graded and covered with 6 in. lime rock and topped with 1½ in. of asphalt. Site was St. Regis Paper Co.'s forest station at Fargo, Ga. Below, dump truck unloads some of the 106 units of chips taken from freshly cut pine trees. Once chips were on site, a Caterpillar D2 tractor (below, right) is used to compact the pile. Tractor was also used to bisect the pile so test samples could be reclaimed from 20 different positions. Six 55-gal. drums were sampled during the five-month period the pile was under study.



STORAGE TIME EFFECT on tear percent vs. tensile percent is shown in this chart. Study shows an average loss in strength of about 5%/month.

EFFECTS OF MOISTURE AND HEAT are studied on calibrated potentiometer connected to thermocouples which were placed in 12 different positions across pile and 6 ft deep.

is greatly reduced by storing chips rather than roundwood.

Test Procedure

The test pile established at St. Regis' chip station in Fargo, Ga., was under the direction of Tom Baker, assisted by Frank Fulford, Ed Cooper and others in the operating and forestry personnel at Fargo. Further tests were conducted at the mill in Pensacola, Fla., by Dick Wilberg, Don Johnson, Ted Crane and others.

An area 100 ft. by 50 ft. was graded, covered with 6 in. of lime rock and topped with 1½ in. of asphalt. Chips from freshly cut trees were placed in the area with a dump truck and 59 loads of chips approximating 106 units of slash pine were placed on the pile. The pile was then compacted with a Caterpillar D2 tractor.

To measure variables, copper-constantan thermocouples were placed in 12 different positions across the pile and 6 in. in from the top. Leads were attached to the potentiometer and tagged for calibration. U.S. Forest Station established a weather station for reporting temperature, rainfall, wind velocity and direction.

To establish base-line data, a 1-gallon sample was taken from every second truck load of chips for Forest Station tests on moisture and specific gravity. Two large scoops of chips were collected from each load and placed in drums for pulping tests at Pensacola. Total sample: Six 55-gal. drums. At the end of the second week the Forest Service sampled the pile for moisture and specific gravity. After that, at one month intervals, similar tests were made.

To get a good sample, the sloping sections of the north end of the pile was removed with a Hough Payloader and about 4 ft. of the main pile was removed to expose a cross section. After sampling, this section was rebuilt, exposing a new cross section previously undisturbed. Half of the sample was sealed in polyethylene, the other half immediately air dried and handled in the same way. When these samples arrived at the Forest Products Laboratory they were placed immediately in a cold-room maintained at near freezing. Evaluation was started immediately after arrival. Samples were also sent to Pensacola for pulping.

Tests Performed

Chips were checked for moisture, specific gravity, identification of fungi, and other deterioration agencies. Pulping tests were made using kraft white liquid at 25% sulfidity. Chips were charged in an experimental digester, white liquor was added to give 17% active alkali. Direct steam was used in the cooks, bringing the temperature to 90°F. in 90 mins. and holding it there for 70 mins. The chips were then blown at full pressure and screened in normal manner.

Resulting pulp sheets were tested for basic weight, tear, tensile and burst. Physical tests were expressed in percent or points per pound of basis weight and results plotted against beating time. Pulp quality was expressed by plotting tear versus tensile and tear vs. burst. In all, 12 cooks were made.

At the Forest Products Lab, microscopical tests were made to determine softness, brashness, discoloration, mold, stain, decay and other organisms.

What The Tests Showed

Temperatures in the pile showed a rapid increase initially in all locations. Near the center of the pile, for instance, it rose sharply to 138°F. in two weeks, diminished sharply to 120°F. in the following two weeks and then decreased gradually to 100° after five months. Near the top surface, the changes in temperature were more erratic but only reached 110°F. at its highest point. In general, all except the outer shell of the pile appears to have reached high temperatures and remained above ambient through five summer months.

Moisture conditions within the pile were less stable. Initially, moisture

appeared to be driven up through the pile and condensed on the outer shell. By the end of the second month this trend reversed and moisture appeared to be increasing progressively from the top down. In the third and fourth months a fairly uniform condition was established in all zones of the pile reaching moisture contents higher than the original conditions.

In regards to wood density, St. Regis reported that several test methods used in the study failed to agree; probably due to limitations in the methods. However, the report indicates that chips appear to deteriorate at the same rate as straw piled pulpwood sampled at Brunswick Pulp & Paper. Specific gravity loss amounted to about 7% after five months storage. Greatest reductions occurred in the outer three feet of the sloping sides of the pile.

Pulp yield was interesting. With exception of tests made at the end of the second month which showed significantly lower yield than any other time (St. Regis was uncertain why), percent total yield in the pile was uninfluenced over a period of five months. Percent screen rejects was significantly lower after a month of storage, reducing from 1.7% to 1.1% on the wood. During the remainder of the time, rejects appeared to increase from the very low 1.1% but still remained significantly lower than original level. Decrease in rejects was reflected in higher screened yield. Sampling positions seemed to be immaterial.

Results of the pulping tests showed a progressive decrease in pulp strength through the fourth month with no further loss in the fifth month. This loss was entirely in tear. Maximum development of tensile was not influenced by storage, nor was maximum development of mullen. Pulp strength deterioration amounted to about 5% per month. Researchers point out that in assessing the amount of strength loss caused by storage it must be remembered that base line data was made from cooks very quickly after trees were cut. Wood rarely reaches a mill this quickly and commercial pulps never have strengths as high as control pulps for this experiment. The observed loss in pulp strength agrees quite closely with reported results of the effects of storage of pulpwood.

Fungus infection first appears after one month as a greenish mold or light stain mostly on the surface of the wood. A dark stain associated with soft-rot attack appears after two months and increases thereafter. The dark stain obscures the observations of typical wood decay. Fungus activity leading to deterioration is most prevalent in the sloping sides of the pile.

AVERAGE COOKING DATA
(with 95% confidence limits on the averages)

Months in Storage	Total Yield	Rejects on Wood %	Screened Yield %	Permanganate Number %	Chip Bulk Density Lbs./cu. ft.	Chip Moisture* %	Number of Cooks
0	47.0 ±0.6	1.7 ±0.1	45.3 ±0.7	22.7 ±1.1	13.7 ±0.2	47.4	10
1	47.3 ±0.6	1.1 ±0.1	46.2 ±0.5	21.9 ±0.9	13.5 ±0.5	47.4	10
2	46.2 ±0.4	1.3 ±0.1	44.9 ±0.4	22.1 ±0.8	13.6 ±0.2	45.8	12
3	48.1 ±0.5	1.4 ±0.2	46.7 ±0.5	23.1 ±0.8	13.2 ±0.2	48.3	12
4	47.4 ±0.6	1.4 ±0.2	46.0 ±0.5	24.4 ±0.9	13.4 ±0.1	55.2	11
5	47.4 ±0.4	1.4 ±0.2	46.0 ±0.4	21.4 ±1.1	13.4 ±0.2	57.4	10

*As received at Pensacola.

COOKING DATA shows how total yield after two months storage was lower significantly, for reasons which are not apparent. Otherwise, the percent total yield was not influenced by five months of storage.

Is Outside Storage Feasible?

St. Regis says "yes!" Air-borne contamination, they say, can be controlled by the individual mills and therefore was not included in the study. In West Coast mills, attack on the wood is influenced by the way the pile is built. Larger piles with less exposed surfaces can be compacted to greater degree and are less subject to deterioration. As a matter of fact, Forest Service studies show that fungi are actually suppressed in the interior of the pile.

Other problems, such as non-uniformity of chips from piles can be controlled by blending chips to give average results.

Tom Baker, energetic St. Regis woodlands engineer, summed up the report aptly in a personal discussion with PULP & PAPER a few weeks ago: "Some skeptics might consider this a negative report since we have not concluded outside chip storage to be any better than roundwood. What we are really saying is that outside storage is at least as good as roundwood and when you consider the vast benefits that can be derived from it and the doors it opens, the report becomes absolute and positive."

With other mills in the South already adopting outside chip storage on the basis of the St. Regis report and at least one mill, Brunswick Pulp & Paper, going ahead with similar studies of hardwood, it would be safe to assume that greater use of wastewood chips in the South is imminent.

TYPICAL SAMPLE OF CHIPS IS TAKEN here and placed in polyethylene bag then sealed with rubber band. These were placed in tightly sealed ice cream cartons and sent to Forest Products Laboratory where they were put in near-freezing storage room. Tests were conducted there to study fungi and other effects of deterioration.

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Plan Now for 1985

. . . in mechanized harvesting. An expert discusses what has to be done today to assure pulpwood demands 25 years in the future

By EVANS JASPER
President
Timberline Equipment Co.

EVANS JASPER has spent eight years studying the mechanization of pulpwood harvesting—especially in the South. He is president of Timberline Equipment's parent firm, Manco Mfg. Co. Timberline distributes mobile field equipment to the forest products industry. Such equipment was originally developed by Manco engineers in collaboration with International Paper Co.'s Southern Kraft div. and is now manufactured by Gar Wood Industries, Wayne, Mich.

● Yearly harvest from commercial forest land represents a $700,000,000 agricultural crop in pulpwood alone. In 25 years twice this value will have to be harvested to meet projected demands. Intensified forestry practices already give assurance that there is sufficient forest land available to do this, provided maximum sustained yield is accomplished by proper management.

Although the above may be true, there is a major problem gradually developing that vitally affects forestry genetics and the economics of the forest products industry. The problem is the cost of harvesting wood—in 1985.

A paper mill can modify its process daily if necessary to accommodate can be made in months, based on known economic facts.
changing cost factors. Major changes

Agricultural farming practices in annual crops can be changed each year, again basing decisions on economic knowns.

Dependence on a Long-Range Crop

The forest products industry is dependent on a raw material crop that takes 25-50 years to mature. The forester must make planting decisions now for 1985, attempting to predict future economic changes and may be retired before he knows whether he was right or wrong.

Mechanization studies in harvesting wood reveal economic factors that must be evaluated now in overall planning of managed forest programs.

1. **Labor**—Manpower studies by the industry indicate a steadily-declining rural farm force—the source of production labor especially in the South, where the major production increase must come. This trend will continue as available jobs in other industry at higher pay continue to increase. In 25 years production labor for the woods will be at a premium and at premium cost.

2. **Productivity**—With mechanization the only answer to increasing the productivity of labor, the large equipment investment in harvesting must be operated as economically as possible. The physical layout of the 1985 crop to be harvested will vitally affect the cost of harvesting by machine and thereby affects present forestry genetics programs.

The economics of regeneration today is important, but the cost of harvesting forests in 1985 will be a far greater factor of raw material cost to the industry, depending on *how* regeneration is done today.

The Ideal 1985 Forest

1. **Terrain**—This is a variable that must be accommodated by equipment. Obviously flat, dry terrain will be harvested most cheaply, with costs rising in rough or wet conditions.

2. **Tree Spacing**—Trees spaced sufficiently to allow equipment access will be cheapest to harvest. Silviculturists will develop maximum fiber trees planted to facilitate mechanized harvesting.

3. **Tree Size**—Machine cycles will be the same whether handling an 18-in. dbh or a 3-in. thinning. Machine productivity, therefore, will be greatest when operating in the largest size trees. Cost of equipment movement, or discrete positioning, will be such a factor that every effort to avoid thinning, marking and selective cutting will be made.

Clear cutting and spaced planting programs will prove to be the most economical for mechanical harvesting. Stumpage contracts with the independent land owner may well include planting and long-range management.

4. **End Product**—To minimize harvesting cost, a given acreage will be planted with a given end product in mind. Market economics will determine whether to plant and harvest for pulpwood, pole timber, saw timber, etc., when and where.

The economics of the private land owner as to cash flow and long-term investment return against product demand will be a factor of planned consideration in procurement.

The managed plantation forest already is a great improvement over the natural forest from a multiple use standpoint, and such plantations, properly planted for mechanization, will produce more fiber cheaper. If cost of harvesting is to be such a factor in 1985, it appears logical that clear cutting of natural forest and immediate spaced replanting will produce the most value today as well as 25 years from now.

Lake States Achieve 3,000,000-Cord Goal

Predictions have long been made that the annual cut of pulpwood in the Lake States (Minnesota, Wisconsin, Michigan) would some day exceed 3,000,000 cords. The breakthrough came in 1959 when some 3,019,000 cords were cut. The harvest was 15% larger than in the previous year and about twice as much as that produced 10 years ago.

These figures were recently released by the Lake States Forest Experiment Station, St. Paul, Minn.

The 1959 cut of pine, aspen, white birch and miscellaneous dense hardwoods was higher than in 1958. Pine in particular was cut more heavily for pulpwood than ever before. Plant residues found wider acceptance. Chips are shipped to Central States fiber mills, but four Lake States plants utilize them in varying amounts.

Announcing: a

NEW GENERATION of POWER

Now from John Deere...two all-new tractors for top woods performance

1010 First off the line and ready for action is the new Ten-Ten Crawler with 40 engine h.p. (gasoline or Diesel). Deere-designed for high work capacity on any logging situation, the Ten-Ten offers a new wide range power concept in its true variable-speed engine. For continued rough work on skid trails and landings, the Ten-Ten has built-in durability with its high horsepower per pound of weight, lugging ability, and a direction-reverser-equipped transmission (optional) for quick maneuverability. New ideas in controls, hydraulics, and operator conveniences make the new John Deere Ten-Ten your best investment in low-cost tractor power.

2010 Scheduled for availability soon, the 50 engine h.p. Twenty-Ten offers high work capacity for larger logging operations. Built for day-in, day-out woods use, the Twenty-Ten will be ready to open a new era of earning power for pulpwood and sawlog operators everywhere. Watch for some of the freshest engineering ideas in the industry in the Twenty-Ten. For example: true variable-speed engine efficiency, new-design track, quick acting hydraulics, and all-day operator comfort. The all-new John Deere Twenty-Ten Crawler will be the tractor experienced loggers choose for quality service and low-cost operation on a wide range of logging applications.

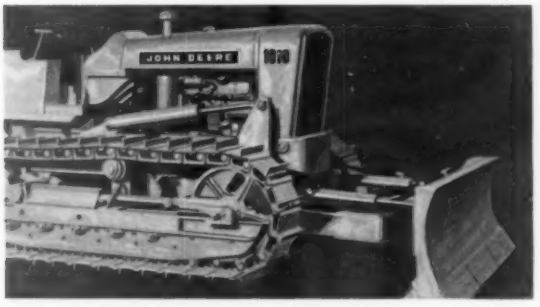
A new generation of leaders...

New Power

All new John Deere-built 4-cylinder, 4-cycle valve-in-head engines, operating at speeds to 2500 rpm deliver the versatile performance that woodlands work requires. Quality construction from fan to flywheel assures top dependability, long service life and low-cost maintenance.

High Productivity

Engineered for all-around logging application, new John Deere Crawlers have what it takes for efficient production with such matched attachments as winch or drawbar, dozer, or log loader.



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Take your choice of inside- or outside-mounted bulldozers with mechanical or all-hydraulic control. Blades, designed for pioneering or clean-up have 3-piece, heat-treated cutting edge.

Deere-designed and built for quality work

woods-wise attachments

Trailing Log Arch

A proved production aid, the John Deere 100 Trailing Log Arch increases skidding capacity of winch-equipped tractors by reducing drag. Logs arrive cleaner at the deck, and the life of haul roads is increased as well. Three-roller fairlead increases tractor maneuverability.

dealer service with a reputation

Integral Log Arch

Provides 50-inch lift above ground level, increasing effectiveness of the winch, yet preserving full tractor maneuverability.

Log Loader

A versatile accessory for low-cost loading of pulpwood, sawlogs, palletized materials.

Parts and service for any John Deere tractor of any year are available through your nearby John Deere Dealer. He and his service crew know how to service and maintain logging tractors and attachments with minimum downtime expense. Find out how this man can help you now. For his name, check with the classified telephone directory or write John Deere, 3300 River Drive, Moline, Illinois.

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tractors bulldozers and logging equipment

Residue Chips Provide Principal Raw Material for Pacific Northwest Pulp

By CARL A. NEWPORT
Pacific Northwest Forest & Range Experiment Station, USFS

—Portland, Ore.

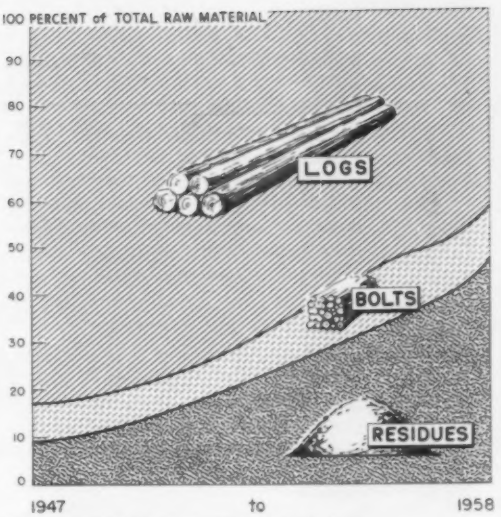
Pulp and paper in the Pacific Northwest has been steadily increasing its use of lumber and plywood residues. In both states products manufactured from residues increased from 9% of total raw material weight in 1947 to 47% in 1958. During this same period the proportion from bolts remained constant at about 10%. Proportion from logs dropped from 83 to 41%.

Apparently, residue chips are providing the principal raw material base for expansion of the pulp industry in both Oregon and Washington. (Trends in use of logs, bolts and residues from 1947 to 1958 are shown in the accompanying chart.)

Previously, the Pacific Northwest Forest & Range Experiment Station has presented statewide estimates of the cubic-foot volume of pulpwood species in the forests of Oregon and Washington. These estimates were based on county-by-county inventories in the two states as a part of the continuing nationwide forest survey.

To provide more detail, the reporting has been changed to show timber volume by individual counties. This will be more useful to those who wish to give specific consideration to pulpwood availability.

Tables I and II, which give net volume of live timber for each forested county as of some designated inventory date since 1950, are subdivided by states within the Douglas fir and ponderosa pine subregions. Those counties in which the inventory was made before 1950 are not reported. These are now being, or soon will be, reinventoried and will be added to the table in future PULP & PAPER World Reviews. Copies of the detailed published report for each county—whether inventoried before or after 1950—can be found in libraries or obtained from



Raw Materials Sources of Pulping Oregon and Washington, 1947-58

Table I—Estimated Net Volume of Live Timbers 5 in. d.b.h. and Larger in Douglas Fir Subregion [By County, Year of Inventory, Species]

(in 1,000,000 cu. ft.)

Western Washington

County	Inventory Year	Total	Douglas Fir	Western Hemlock	True Fir	Other Soft-woods	Hard-woods
Clallam	*	—	—	—	—	—	—
Clark	*	—	—	—	—	—	—
Cowlitz	*	—	—	—	—	—	—
Grays Harbor	1951	5,032	747	2,541	509	806	429
Island	**	—	—	—	—	—	—
Jefferson	*	—	—	—	—	—	—
King	*	—	—	—	—	—	—
Kitsap	**	—	—	—	—	—	—
Lewis	1952	5,975	3,228	1,208	916	338	285
Mason	1951	1,523	842	382	47	115	137
Pacific	1950	2,502	400	1,267	125	558	152
Pierce	**	—	—	—	—	—	—
San Juan	*	—	—	—	—	—	—
Skagit	1957	3,453	529	930	1,203	517	274
Skamania	1950	5,497	2,806	951	1,118	529	93
Snohomish	1955	4,215	809	1,480	931	618	377
Thurston	1954	596	412	26	12	46	100
Wahkiakum	*	—	—	—	—	—	—
Whatcom	1957	2,703	473	750	740	466	274

Western Oregon

Benton	*	—	—	—	—	—	—
Clackamas	*	—	—	—	—	—	—
Clatsop	1952	1,382	355	792	27	107	101
Columbia	1954	668	478	7	21	42	120
Coos	*	—	—	—	—	—	—
Curry	*	—	—	—	—	—	—
Douglas	*	—	—	—	—	—	—
Hood River	1954	1,062	480	95	282	202	3
Jackson	*	—	—	—	—	—	—
Josephine	*	—	—	—	—	—	—
Lane	1956	17,384	13,075	1,558	844	1,433	474
Lincoln	1955	3,325	2,116	527	45	228	409
Linn	*	—	—	—	—	—	—
Marion	*	—	—	—	—	—	—
Multnomah	*	—	—	—	—	—	—
Polk	*	—	—	—	—	—	—
Tillamook	1955	2,508	980	820	—	430	278
Washington	*	—	—	—	—	—	—
Yamhill	*	—	—	—	—	—	—

*Inventory made before 1950. Volumes not shown because sufficient change may have occurred to substantially modify original results.
**Counties inventoried before 1950 but reinventoried in 1959; reports soon available.

Table II—Estimated Net Volume of Live Timber 5 in. d.b.h. and Larger in Ponderosa Pine Subregion [By County, Year of Inventory, Species]

(in 1,000,000 cu. ft.)

Eastern Washington

County	Inventory Year	Total	Douglas Fir	Ponderosa Pine	True Firs	Lodgepole Pine	Other Soft-woods	Hard-woods
Adams†	—	—	—	—	—	—	—	—
Asotin	1958	139	39	40	40	5	15	—
Benton†	—	—	—	—	—	—	—	—
Chelan	*	—	—	—	—	—	—	—
Columbia	1958	453	134	91	152	12	63	1
Douglas†	—	—	—	—	—	—	—	—
Ferry	*	—	—	—	—	—	—	—
Franklin†	—	—	—	—	—	—	—	—
Garfield	1958	245	57	63	65	13	47	—
Grant†	—	—	—	—	—	—	—	—
Kittitas	1953	2,629	1,069	181	692	98	584	5
Klickitat	1954	1,005	459	400	111	1	26	8
Lincoln	*	—	—	—	—	—	—	—
Okanogan	**	—	—	—	—	—	—	—
Pend Oreille	*	—	—	—	—	—	—	—
Spokane	*	—	—	—	—	—	—	—
Stevens	*	—	—	—	—	—	—	—
Walla Walla	1958	44	22	13	7	—	2	—
Whitman	*	—	—	—	—	—	—	—
Yakima	1954	3,574	719	1,136	825	209	665	20

Eastern Oregon

Baker	1956	1,478	300	589	301	79	205	4
Crook	1952	1,086	124	891	43	4	24	—
Deschutes	1953	1,626	12	844	128	425	217	—
Gilliam†	—	—	—	—	—	—	—	—
Grant†	—	—	—	—	—	—	—	—
Harney	1953	807	28	748	31	—	—	—
Jefferson	1953	1,041	150	567	131	29	162	2
Klamath	*	—	—	—	—	—	—	—
Lake	*	—	—	—	—	—	—	—
Malheur	1956	38	14	16	4	—	4	—
Morrow	1954	488	88	235	64	53	48	—
Sherman†	—	—	—	—	—	—	—	—
Umatilla	1958	1,289	295	329	361	131	170	3
Union	1958	1,893	315	377	515	276	409	1
Wallowa	1957	1,803	437	500	377	164	307	18
Wasco	1954	1,647	711	384	299	4	248	1
Wheeler	1953	786	249	320	160	7	50	—

*Inventory made before 1950. Volumes not shown because sufficient change may have occurred to substantially modify original results.
**County inventoried before 1950 but reinventoried in 1959; report soon available.
†County nonforested.

the Pacific Northwest Forest & Range Experiment Station.

From the volume of live timber reported comes raw material that is the basis for the diversified forest industries in the region. Much of that left standing accumulates growth and provides an orderly harvest in succeeding years. That which is harvested is manufactured into lumber and plywood, as well as pulp and paper. In the process of manufacturing lumber and plywood, residues are developed that provide additional volume of raw material suitable for pulping. In 1958, approximately 840,000,000 cu. ft. of residues were produced in the two states in the milling of these two primary forest products; of this, about 477,000,000 ft. were classed as coarse residue that is either now or potentially suitable for chipping. About 698,000,000 cu. ft. of residues were developed in the Douglas fir subregion, of which about 412,000,000 cu. ft. were coarse (Table III). Slightly over half this was used as pulp chips.

Table III—Volume of Plant Residues Developed from Manufacture of Lumber and Plywood in Oregon and Washingean [By subregions, 1958]

Residue	Douglas Fir Subregion		Ponderosa Pine Subregion	
	Cubic feet	Tons	Cubic feet	Tons
Coarse	412,980,000	5,730,000	64,280,000	771,000
Fine	285,530,000	3,940,000	77,340,000	929,000
Total	698,510,000	9,670,000	141,620,000	1,700,000

Brief Look at the Pulpwood Situation in Idaho and Montana

By ALVIN K. WILSON
Intermountain Forest & Range Experiment Station, USFS

—Ogden, Utah

In the Intermountain - northern Rocky Mountain area, the development of pulpwood potentialities has barely started. Although the pulpwood cut in Idaho and Montana—the only states actively producing pulpwood—increased 325% between 1948 and 1956, the amount produced is a small fraction of the possible cut (shipped to Wisconsin kraft mills).

As an instance, it has been estimated that eastern Montana alone could sustain an annual cut for pulpwood of more than 750,000 cords, with full allowance for production of other primary forest products. This 750,000 cords is more than twice the 1956 output of all Idaho and Montana combined.

All of the timber species of Idaho and Montana, except Western red cedar, have good pulping characteristics, but lodgepole pine is the single species with the greatest development potential. The extensive pure stands of lodgepole pine, totaling well over 7 million acres in the two states, are a practically untouched pulpwood reservoir.

In addition to the live timber potential for pulpwood in Idaho and Montana, and the possibilities for using woods residues from sawlog operations, about 36 million cubic feet of chippable residues are produced annually at sawmills and veneer plants. About 25% of this is used for fuel and another 40% for other purposes (including pulp chips), leaving about 12 million cubic feet unused for any purpose.

Of particular interest in this connection is the fact that Montana now has a 250-ton pulpmill and a paper mill operating entirely on chipped sawmill residues (Waldorf-Hoerner Paper Products Co., Missoula, Mont.).

ESTIMATED NET VOLUME OF LIVE TIMBER 5 INCHES D.B.H. and LARGER in IDAHO and MONTANA[1]

Species	Total[2]	Idaho		Montana	
		Northern[2]	Southern	Western[2]	Eastern
		Million cubic feet			
Western white pine	2,626	2,389	—	237	—
Ponderosa pine	5,327	1,220	1,876	1,581	650
Western larch	3,717	1,232	77	2,408	—
Douglas-fir	10,255	2,462	3,101	2,597	2,095
True firs	3,723	2,496	805	253	169
Spruce	2,790	860	539	826	565
Lodgepole pine	6,880	1,249	1,554	997	3,080
Other softwoods	1,754	1,258	21	211	264
Total softwoods	37,072	13,166	7,973	9,110	6,823
Cottonwood and aspen	344	39	63	50	192
Other hardwoods	11	5	—	—	6
Total hardwoods	355	44	63	50	198
Total all species	37,427	13,210	8,036	9,160	7,021

[1] Source: U.S. Forest Service, Forest Survey Resource Reports for northern Idaho (1953), Montana (1952), and Timber Resources Review data for southern Idaho (1952).
[2] Northern Idaho is north of the Salmon River; western Montana is west of the Continental Divide.

Production of pulpwood in Idaho and Montana for selected years, 1948-1956[1]

Year	Total	Idaho		Montana	
		Northern	Southern	Western	Eastern
		Standard cords			
1948	85,095	39,152	—	3,148	42,795
1949	97,955	45,362	—	2,511	50,082
1950	85,561	33,510	—	3,802	48,249
1952	229,410	87,851	—	12,823	128,736
1954	148,080	90,458	[2]5,447	16,115	36,060
1956	361,354	203,889	23,124	35,015	99,326

[1] Source: Intermountain and (former) Northern Rocky Mountain Forest and Range Experiment Station Research Notes. Does not include pulp chips.
[2] Pulpwood shipments from southeastern Idaho started in 1953.

RECORDS PROVE—

D6 BUILDS LOW-COST HAUL ROADS!

Nebo Lumber Company, Dardanelle, Arkansas, bought its first Caterpillar D6 Tractor in 1953. For six years, the company kept close figures on costs, which were extremely low. As a result, when owner Noel Jones decided to update his equipment, there was only one choice—another D6!

Building haul roads in rocky, mountainous terrain is the main job of this D6 with No. 6A Bulldozer. It averages ½ to 1 mile of 12-foot-wide road a 10-hour day. Mr. Jones says it's doing the work at *even lower cost than his first machine*. He also says: "We haven't had any down time in spite of the very rough dozing work."

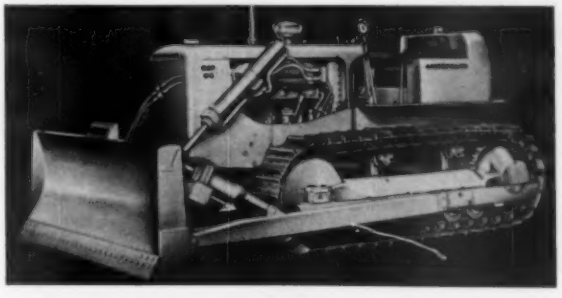
For example, take the oil clutch, a Caterpillar exclusive which far outlasts conventional clutches. In fact, it delivers up to 2000 hours' service without adjustment. It's just one of many advances that keep the husky D6 well ahead of its class in productivity and low operating costs.

NOW THE NEW D6 Series B

Most recent D6 model is the Series B. Work-styled from radiator guard to drawbar, it sets a new production pace. A new 93 HP Cat D333 Engine delivers 25% more lugging ability. New lifetime lubricated track rollers with exclusive patented floating ring seals *never* need servicing. New hydraulic track adjusters (optional) require only a few strokes of a grease gun to assure proper track tension. A new integral hydraulic system frees the front and rear of the machine for tractor-mounted tools. And new co-ordinated controls reduce operator effort and increase production.

A complete line of matched tools—winches, arches, sulkies, bulldozers and controls—multiplies the usefulness of the D6B, makes it a big earner. Any way you use it, you're ahead in production and profits. For proof, see your Caterpillar Dealer!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.



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HEAVY-DUTY MACHINES
FOR THE HARD WORK

Logging, Too, Can be Safe

The Stamm Tree Farm div. of Crown Zellerbach Corp. in Vernonia, Ore., may deservedly bear the title, "Nation's Safest Logging Show." During a period of more than five years the farm operated well over 2,000 injury-free days. The Vernonia logging trucks toted up more than 1,500,000 miles of travel, the pickup trucks about half that mileage.

The 75-man woods crew worked 596,668 injury-free man-hours since early in 1955—154,000 more than achieved by a previous record.

A check of available statistics indicates this to be an all-time record for consecutive injury-free days in U.S. logging operations. Stamm loggers have been awarded 22 citations, including four National Safety Council plaques and Governor's Logging Safety Awards.

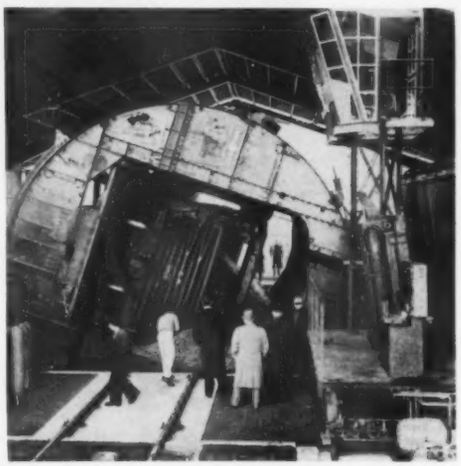
Safety is not a "come lately" aspect of CZ policy. But, even this safety-conscious organization has tended to experience lower injury frequency rates in its manufacturing divisions than in woods operations.

Last fall President Reed O. Hunt of Crown Zellerbach eliminated any possibility of accepting two standards of safety—one for mills, another for woods. He declared that the idea that logging is an extra-hazardous part of the industry and entitled to special forgiveness where accidents are concerned is no longer acceptable. Praising the progress made through the industry's joint labor-management program, he called attention to the fact that the improvement had during the previous 14 years prevented at least 9,000 injuries in Washington alone.

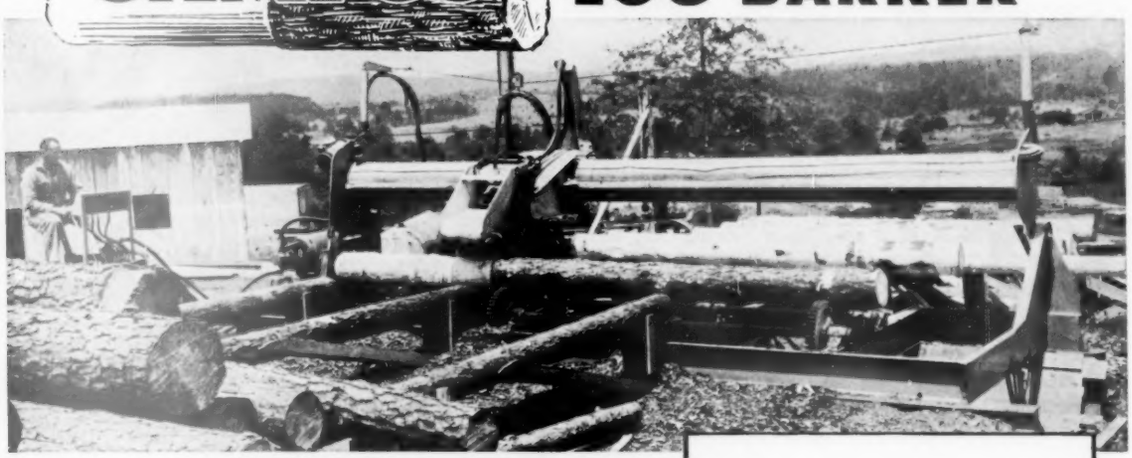
"All of us," Mr. Hunt continued, "have a real economic stake in industrial safety. This is particularly true in logging where we are paying stiff penalties for too many accidents. Last year logging, with only 1½% of the State of Washington's man-hours of employment, accounted for 7% of its lost-time accidents and 20% of its industrial fatalities."

Rotary Dumper Speeds Unloading in Western Canada

Speed in unloading chip-carrying freight cars is achieved at new bulk dock at Port Moody on the Fraser river, British Columbia. The Link-Belt Co. equipment is believed to be the first application of its type in the pulp industry and is used with gondola cars routed from Kamloops Wood Conversion Ltd.'s sawmills in the interior to tidewater at Vancouver. Dumping operation takes less than 90 secs., chips falling into a series of hoppers below, from where they are transported via Chain Belt conveyors to waiting barges.



CAMPCO LOG BARKER



Exclusive Fluid Drive — for Hard or Soft Wood

Quick, thorough bark removal, with all operations controlled from central station at either end of machine. One prime mover—electric motor or gas or diesel engine—provides all power requirements. Logs turned by bull wheels with special Mapco Taper Wedge Locks which permit quick, easy relocation for logs of various lengths.

Standard models are for logs 5"—36" diameter and lengths of 20', 24' and 26'. Special models available for West Coast hardwood and veneer logs up to 55" diameter and 30' lengths.

Write for complete information

In South, address Machine Products Co., Gadsden, Ala.

CARTHAGE MACHINE CO.
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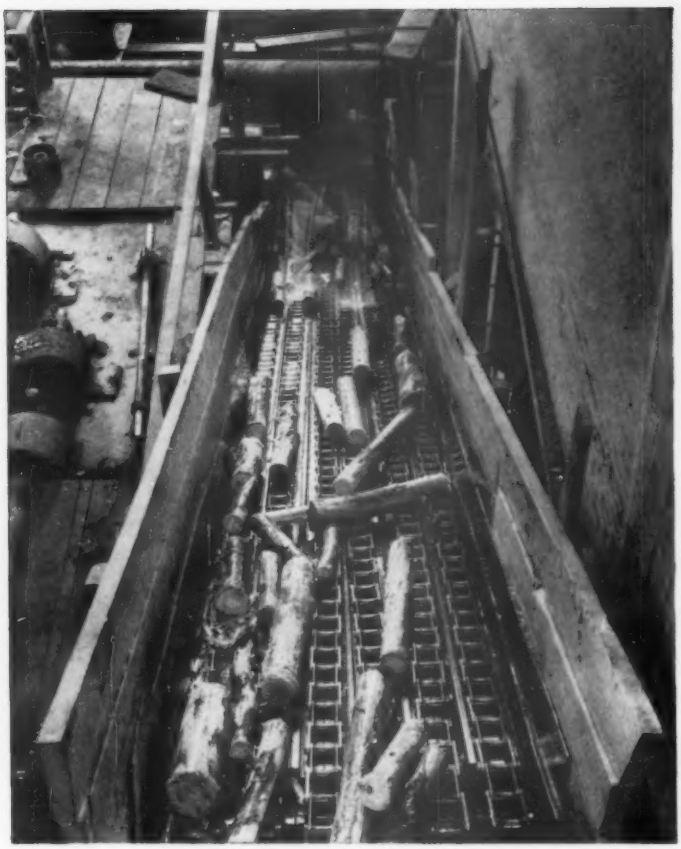

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The automatic stop motion warning device

Sandy Hill announces

Scofield Felt Conditioner designed for a 238" width felt

important new advances in

the SCOFIELD felt conditioner

With sturdy new designs applicable to machines over 200 inches in width, the Scofield Automatic Felt Conditioner is now available for use on ANY width paper machine.

A *detergent application system* has been developed as optional equipment to introduce prescribed detergents when and as needed to promote longer felt life.

More *traveling nozzles* placed at closer intervals give greater assurance that every square inch of the felt gets a thorough cleaning action. The *nozzles are adjustable* so that the spray may be directed to give proper impingement against the felt.

An optional *variable speed drive* allows for altering the speed of the nozzle travel to suit changing operating requirements.

A new *stopped motion warning device*, offered as auxiliary equipment, is recommended as a safety measure, especially for use on larger high pressure units.

For cleaner felts and longer felt life, install the Scofield Automatic Felt Conditioner with the other two components of the Scofield Felt Conditioning System . . . the Scofield High Pressure Shower and the Scofield Venturi Suction.

THE SANDY HILL IRON AND BRASS WORKS
HUDSON FALLS, N. Y.

Strictly Personal

Southern

Several new promotions have been announced by **T. C. Bannister,** newly named v.p. of Bowaters Carolina Corp. **George Jackson** is now prod. mgr.-pulp. His former position of pulp mill supt. has been filled by **R. A. Ashworth, III,** formerly asst. pulp mill supt. **Murphy Jay Grantham** moves up from foreman to asst. pulp mill supt. while **John Forest** has been promoted to foreman from dryer operator. In the power dept. **James Fordham** has been promoted to asst. power plant supt. And **James Waiser, Jr.,** has joined Bowaters as mechanical supt. He was formerly with St. Regis Paper Corp. in Jacksonville.

Ben Guenther, who was paper mill supt. at Marathon div. in Menominee, Mich., has been named board mill supt. at the Marathon Southern mill in Naheola, Ala.

John Fulkerson, who served as asst. supt. in the paper mill, becomes asst. board mill supt. and **William Woods** replaces him as asst. paper mill supt. Coating Supt. in Naheola will be **Don Minsloff,** who comes from the Menominee plant and onetime prod. services supervisor **Don Hesselman** will be finishing supt. **Robert Stephenson** replaces Mr. Hesselman. **Russell Kazmarynski** transfers to a new position as supervisor of engineering planning.

Riegel Carolina has added six new engineers to its staff: **M. M. Galloway,** a graduate mechanical engineer from North Carolina State; **Robert G. Knowles,** chemistry alumnus of N.C. State; **Melvin Moody,** who received a b.s. in pulp and paper technology from North Carolina; **Fred Stokey,** a graduate of Virginia Polytechnic in chemical engineering; **W. H. Wiggins** who graduated from Georgia Tech in chemical engineering; and **James Yopp,** another North Carolina graduate in chemical engineering. . . . Corrosioneering, Inc., a Charlotte, N.C. firm headed by **James Barnett,** has been named North and South Carolina representative for the Ceilcote Co., producers of corrosion-resistant coatings and linings.

Five top men have also been added to the Gulf States' staff at Demopolis as a result of its entry into the board converting field. **Louis Carola** is gluing supervisor. He was formerly with Atlanta Paper Co., now Atlanta-Mead. **Robert Hewen,** formerly with Wayne Paper Box and Printing Corp., is also gluing supervisor. **Herman Gibby,** a native Atlantan and veteran of Mead-Atlanta, is cutting supervisor. **Charles Judah,** onetime pressman on an Alabama weekly newspaper and more recently leadman-pressman for Mead Packaging Co. in Atlanta, and **James Boschet,** formerly with Wayne Paper Box and Printing Co., have both been added as printing supervisors. . . . **George E. Motz,** onetime sales and technical rep for Nopco Chemical Co., and an alumnus of Penn State, has been named southeastern representative for Arnold, Hoffman & Co.

MaGee Buckley Natwick

East Texas Passes Millionth Hour Without Lost-Time Accident

Bearing down on safety, **G. L. MaGee,** safety coordinator; **R. M. Buckley,** president, and **A. G. (Buff) Natwick,** vice pres. and resident mgr., of East Texas Pulp & Paper Co. prepare to celebrate 1,000,000 man-hours without lost-time due to work injury at Evadale, Texas plant. As result of the 271 accident-free days, Hormel hams were given all employees. The 675 hams weighed more than 4 tons.

Fogelberg

Traczewitz

Fogelberg Retires as IP's Chief Forester in South

S. E. **Fogelberg,** chief forester of International Paper Co.'s Southern Kraft Woodlands div. since 1942, has retired. A native of Sweden, he is a graduate of the Royal Forest Institute. **O. G. (Tracy) Traczewitz,** a graduate of the Univ. of Michigan and World War II navy veteran, is succeeding to the top forestry post. He joined IP in 1941 and has been asst. chief forester since May.

James E. Nicholas, a civil engineer with the Southern Kraft div. of International Paper, has been promoted to division civil engineer. He has been a construction engineer for the company's Long-Bell division since May, 1959. . . . At Halifax Paper Co. div. of Albemarle Paper Mfg. Co., Roanoke Rapids, N.C., **John W. Gladstone** has been promoted from quality control supervisor to tech nical service supt.

Social notes: Friendly competition between Brunswick Pulp & Paper and Union Bag-Camp at Savannah has resulted in victory for the Brunswick folks. They defeated Union Bag in their annual golf match, held this year at Brunswick. Apparently the home course is a lucky one. Last year Union Bag-Camp whipped the Brunswick stickmen on the Mary Calder course in Savannah. . . .

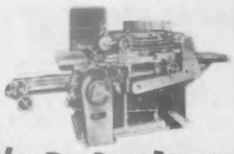
A. M. (Buck) Fairbrother, v.p. and mgr. of Champion Paper & Fibre's Canton, N.C., mill a veteran of 25 years service with the company, has retired. He plans "extensive travel" for the next few years. **Willis Kirkpatrick** has been named acting division mgr. . . . **Harold E. Miller,** who has served West Virginia Pulp and Paper for 43 years has also retired from the Covington, Va., mill where he was supt. of recovery operations. He worked a total of 15,749 days with his company. A sad note is the report of the death of **W. C. Davis,** plant traffic mgr. of St. Regis' Jacksonville plant. He was killed in an automobile accident.

William F. Diehl, Jr.

Bently Bolton Dimitri

Three-Time Winner

For the third time, West Virginia Pulp & Paper Co. research chemist **M. S. Dimitri** of the Charleston, S.C. mill has won the $200 award in the annual essay contest sponsored jointly by John W. Bolton & Sons Inc. and the Superintendents Assn. Here with Mr. Dimitri are **R. L. Bentley,** Charleston mill mgr., and **John G. Bolton,** president of the sponsoring company.



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Midwest

Two Promoted at KVP Sutherland

Jager

Flanagan

Kalamazoo, Mich. firm names **Thomas Flanagan** technical director of the Sutherland div. and **Cobe Jager** wax division supt. of the KVP div.

Mr. Flanagan since March 1959 has served as supt. of the KVP wax division and also as asst. supt. of the wax and printing divisions, technical asst. to the vice pres. of sales and technical asst. to the mgr. of manufacturing. In 1954-55 he was on the research laboratory staff at KVP Sutherland's Espanola, Ont. pulp and paper mill.

Mr. Jager was formerly supt. of the wax production department at KVP and prior to that had been asst. supt.

James J. Shipman, formerly director of research, is elected a vice pres. of Kimberly-Clark Corp., Neenah, Wis.; he continues to head research operations. . . . **Franklin E. Hufford,** since 1945 gen. traffic mgr. for Minnesota & Ontario Paper Co., has retired following 47 years in the traffic field; his successor is **C.D. Cooper,** former asst. gen. traffic mgr. . . . **LaVerne B. Paulsen** is appointed project mgr. on the staff of the Manufacturing Services dept., Hinde & Dauch div., West Virginia Pulp & Paper Co.; formerly project leader in electrical design at West Virginia's Charleston, S.C. mill, he now headquarters at Sandusky, Ohio.

R.C. Bown becomes mgr. of sales in the Control dept., Allis-Chalmers Mfg. Co., to succeed **G.G. Brooks,** who is transferred to Consolidated Systems Corp., Monrovia, Cal.; succeeding Bown as mgr. of the Allis-Chalmers rectifier section is **W.G. Williams.** . . . Two promotions are announced in the Engineering dept., Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.: **Edward P. Kryshak,** gen. construction supt., becomes chief structural engineer, and **John E. Drexler** succeeds Mr. Kryshak; Mr. Drexler was a construction foreman. . . . In another CWP&P staff change, **Joseph M. Fuller** is named product mgr. of tubes and cores; he was formerly Midwestern sales representative for Sonoco Products Co., Hartsville, S.C. . . .

John C. Plankinton, former asst. resident mgr. of Crown Zellerbach Corp.'s Western-Waxide div. packaging plant in St. Louis, is named to a similar post at the new St. Louis carton plant operations. . . . **Sidney L. Abramson,** president of Central States Paper & Bag Co., St. Louis, died recently at the age of 60. . . . **Rolf Serenius,** for six years associated with Powell River Co. Ltd. (now MacMillan, Bloedel & Powell River), is named a research engineer for Nekoosa-Edwards Paper Co., Port Edwards, Wis.; he is a 1951 chemical engineering graduate of the University of Abo, Finland.

W.R. Tobin becomes gen. mgr. of Packaging Corp. of America's paperboard mill in Vincennes, Ind.; former mill products sales mgr. at the Grand Rapids, Mich. paperboard mill, his industry career began in 1936 with American Box Board Co., where he held positions as chemist, research and development mgr., technical supt. and asst. sales mgr. . . . **L. Baxter Chamberlain** becomes gen. mgr. of Container Corp. of America's Lake Shore paperboard mill in Chicago; for the past two years he has been assigned to the firm's West German subsidiary, Europa Carton AG, where he served as gen. mgr. of the new Hoya paperboard mill and as management representative at that mill. . . .

Consolidated Water Power & Paper Advances Two

Molsberry

Dent

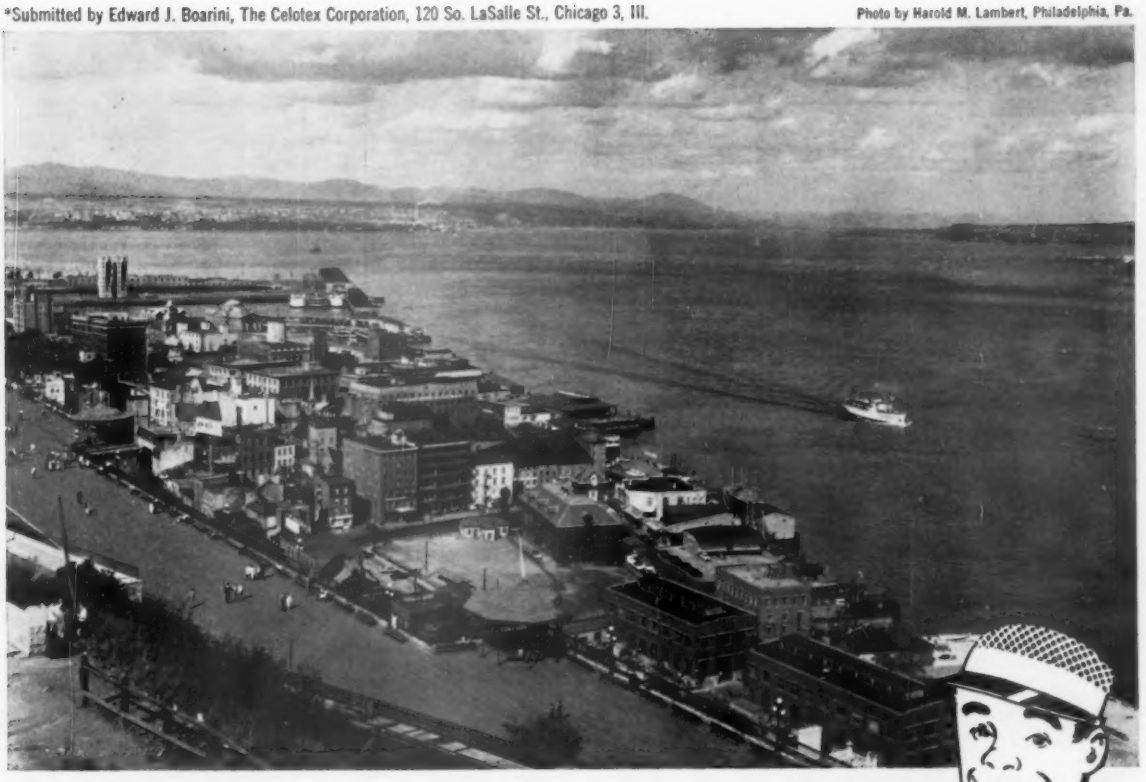
Two executive appointments are reported by **Stanton W. Mead,** president of Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

M. V. Molsberry, chief engineer, becomes mgr. of power and engineering consultant to succeed the late **W. F. Thiele. A. R. Dent** succeeds Mr. Molsberry as chief engineer.

Mr. Molsberry joined the company's engineering staff in 1937, serving as electrical and steam engineer 13 years. He has been chief engineer since 1950. Mr. Dent has headed the Engineering dept.'s civil and construction section since 1952. He began his CWP&P service in 1946 as a civil engineer.

*Submitted by Edward J. Boarini, The Celotex Corporation, 120 So. LaSalle St., Chicago 3, Ill.

Photo by Harold M. Lambert, Philadelphia, Pa.



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SHULER & BENNINGHOFEN, HAMILTON, OHIO

PULP & PAPER

Strictly Personal

Calvin F. Lloyd has been promoted to president of the Gardner div. of Diamond National Corp. to succeed **Richard L. Siegel**, who recently resigned; he joined the former Gardner Board & Carton Co., Middletown, Ohio, 30 years ago and prior to his recent appointment was asst. to the president. . . . **E.S. Dulin** has retired as board chairman of the Byron Jackson div. of Borg-Warner Corp. . . . **John A. Summerlin** is named sales mgr. of the Chase Bag Co. paper mill, Chagrin Falls, Ohio; prior to joining the firm he was director of sales for Monadnock Paper Mills, Bennington, N.H.—Don W. Zeigler

J. Fred Shelton, formerly asst. to the chief power engineer at Mosinee Paper Mills Co., becomes chief power engineer at Wausau Paper Mills Co., Brokaw, Wis. He will assume full responsibility for all utility operations at Wausau on the contemplated retirement this fall of **Frank Scholl**, who will soon complete 50 years' service.— Don Zeigler

de la Macorra Zeigler Macdonald

New Mexican Technical Association Organized

During the recent International Chemical Congress in Mexico City, the formation of a Mexican technical association similar in organization and purpose to TAPPI was announced.

Among those attending the Congress was **R. G. Macdonald**, asst. to the president of TAPPI (U.S.A.), who assisted the Mexican group in establishing the new association.

A committee was named to propose rules and by-laws, and a general meeting was held August 17. Shown above with Mr. Macdonald during the sessions are **Fernando de la Macorra**, gen. supt., San Rafael Mills, and **Carlos Zeigler**, mgr. of the Cellulose div., Celanese Mexicana SA.

Members appointed to the organization committee include: **Dr. Dante C. Cusi**, San Cristóbal Mill; **Jesús Escalante**, San Rafael Mill; **Sergio Vadillo**, San Rafael; **A. N. Leth**, Celulosa de Chihuahua, and **Carlos García Robles**, industry engineer and sales mgr. for Wangner de Mexico. Among the social gatherings was one sponsored by **John Rudolf**, mgr. of Parsons & Whittemore de México SA; another hosted by **Bill Vélez**, export mgr. for Cameron Machine Co.

Pacific

Elected as directors of Georgia-Pacific Corp.: **Stewart S. Hawes**, president of Blyth & Co. Inc., New York, N.Y., and **Robert E. Flowerree Jr.**, president of Georgia-Pacific Paper Co. Mr. Flowerree replaces **H.S. Daniels**, who resigned as a G-P director and was elected chairman of Georgia-Pacific Paper Paper. . . . **Oscar Caronongan**, chemical engineer with Bataan Pulp & Paper Mills Inc., has been at the Albany, Ore. plant of Western Kraft Corp. Bataan will build a mill in the Philippines to manufacture paper from bamboo pulp. . . . **David G. Cummings** named gen. mgr. of Container Corp. of America's plant in Fresno, Cal.

Crown Zellerbach Corp.'s Western-Waxide div. reports resident mgr. changes: **Thomas Osborne**, St. Louis, Mo., moves to Los Angeles; **Arthur Hauschild** goes from Los Angeles to San Leandro, Cal., and **Berry Dillon** to St. Louis from San Leandro. . . . **D.R. Schmidt**, vice pres. of Crown Zellerbach Canada Ltd., has returned to the firm's San Francisco headquarters as an executive of the recently established International div. Mr. Schmidt from 1954 to 1957 was sec. of CZ. . . . **Clare Hume**, asst. chief chemist, becomes chief chemist at Publishers' Paper Co., Oregon City, Ore., as successor to **Clifford Mayer**, who moves up to the post of technical supervisor. . . .

Jack W. Knapp, buyer for the Tacoma plant for the past five years, joins the sales staff in the Pacific Northwest area for the Western Chemical div., Hooker Chemical Corp. . . . **Paul D. Close** joins Simpson Timber Co.'s research staff in Seattle as senior consulting engineer. . . . St. Regis Paper Co. fills supervisory positions at expanding kraft center in Tacoma: **Corydon Wagner Jr.**, formerly asst. mgr. of the Olympia plywood plant, becomes asst. resident mgr.; **Robert Siburg**, pulp shipping foreman, is named traffic supervisor and is succeeded by

PAPER MILLS ARE SOLVING THEIR FOAM PROBLEMS WITH

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Mechanical pulp bleaching...

A combination of peroxides can save up to $1.25 a ton over a hydrogen peroxide treatment.

Over 95% of all groundwood bleacheries have found that a combination of hydrogen and sodium peroxides cuts bleaching costs up to $1.25 a ton. The reason—combination formulas eliminate the use of caustic soda.

How is this possible? Because of the bleaching chemistry involved. When hydrogen peroxide is used alone, substantial quantities of caustic soda must be added to assure effective bleaching. But when sodium peroxide is part of the formula, caustic soda is formed and additional quantities aren't needed. When caustic limits of this solution are reached, hydrogen peroxide is added to complete the balance and the bleaching formula is now ready to use.

The charts below show the savings possible in a one-stage tower bleaching process when a combination of peroxides is used instead of a single hydrogen peroxide: For normal brightness, the saving runs from $.90 to $1.00 a ton; for premium brightness, $1.15 to $1.25 a ton.

You can obtain cold soda pulp and groundwood pulp brightness as high as 75 by this method. Cold soda pulp can be bleached in the refiner in absence of a bleaching tower with brightness gains up to 20 points.

For further information, get in touch with your Du Pont Representative listed at right.

EXAMPLE #1

ONE-STAGE TOWER PROCESS FOR NORMAL BRIGHTNESS

A. Using combination of peroxides

5.0% silicate
1.2% "Solozone" sodium peroxide
0.7% "Albone" 50 hydrogen peroxide

B. Using one peroxide only

5.0% silicate
1.2% NaOH
1.7% "Albone" 50 hydrogen peroxide

SAVINGS OF $.90 TO $1.00 PER TON BY USING COMBINATION OF PEROXIDES

EXAMPLE #2

ONE-STAGE TOWER PROCESS FOR PREMIUM BRIGHTNESS

A. Using combination of peroxides

5.0% silicate
1.5% "Solozone" sodium peroxide
1.25% "Albone" 50 hydrogen peroxide

B. Using one peroxide only

5.0% silicate
1.5% NaOH
2.5% "Albone" 50 hydrogen peroxide

SAVINGS OF $1.15 TO $1.25 PER TON BY USING COMBINATION OF PEROXIDES

Peroxides give you you up to $1.25 a ton!

Chemical pulp bleaching...

Peroxides—alone or in combination —give brightness up to 92 with excellent stability.

Mills throughout the country are finding that peroxides, alone or in combination, can give chemical pulp high brightness stability—without significant decrease in pulp strength or yield.

IN KRAFT BLEACHING, a five-stage process is producing outstanding results for a number of mills, among them a southern papermaker now producing over 100,000 tons of high brightness pulp annually. This process combines the best advantages of three bleaching agents—hypochlorite, chlorine dioxide and peroxide—to give brightnesses up to 90 with excellent brightness stability.

IN SULFITE BLEACHING, three peroxide processes are proving successful—a single-stage peroxide process which brightens pulp up to 75; a two-stage hypochlorite-peroxide process which brightens up to 86; a four-stage chlorine-caustic-hypochlorite-peroxide process which brightens up to 92. For information, call your Du Pont Representative listed below.

TECHNICAL SERVICE FOR YOU . . . Peroxides have a powerful bleaching action that produces high brightness pulp with excellent brightness stability. But it takes skill and experience to use peroxides efficiently. With Du Pont "Albone" hydrogen peroxide and "Solozone" sodium peroxide, you get the most authoritative advice and service available . . . from the manufacturer of *both* products.

Du Pont specialists can give you practical bleaching formulas for groundwood, cold soda, kraft and sulfite. They'll help you set up your bleaching operation, train operators, and check frequently to make sure your bleaching quality stays high and costs stay low.

Call your Du Pont representative listed below; he'll be glad to start a program to help you determine the advantages of Du Pont peroxides in your mill. Or write: Du Pont, Electrochemicals Department, Peroxygen Products Division, Wilmington 98, Delaware.

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PULP & PAPER

Strictly Personal

Richard Welch. . . .

Alfred Opdahl, Crown Zellerbach Corp.'s resident forest engineer at Neah Bay, transfers to Portland, Ore. as asst. chief logging engineering, Northwest timber operations. . . . **W.L. Wickman,** CZ forest engr., Cathlament, moves to Neah Bay as resident forest engineer.

Jack H. Wood, asst. director of the Div. of Cooperative Forest Fire Control section in the Washington, D.C. office of USFS, promoted to Chief of the Information & Education Div., Pacific NW region. The asst. director position will be filled by **Edward H. Marshall,** who has been chief of Cooperative Forest Fire Control section, State & Private Forestry Div. of Region 6 at Portland, Ore., since 1949.

D.C. Stahle, former mgr. of Tetra Pak packaging for Crown Zellerbach Corp., San Francisco, appointed mgr. of dairy packaging for the Western-Waxide div., San Leandro, Cal. . . . **Gene Bartu** joins Crown Zellerbach as representative for the Chemical Products Sales div. at Camas, Wash.

Thomas Aspitarte formerly plant pathologist for the research laboratories of United Fruit Co. at LaLima, Honduras, assumes duties as research chemist for CZ's Central Research div., Camas. . . . **Silvia Cabella,** new asst. engineer for Crown Z's CRD, Camas, is first woman engineer to be employed in the division. . . . **Gordon Johnston,** who since 1958 has worked in research at the Univ. of Oregon Medical School, Portland, Ore., joins Crown Zellerbach as research chemist, CRD, Camas. . . . **Edward Eddy** joins as asst. chemist.

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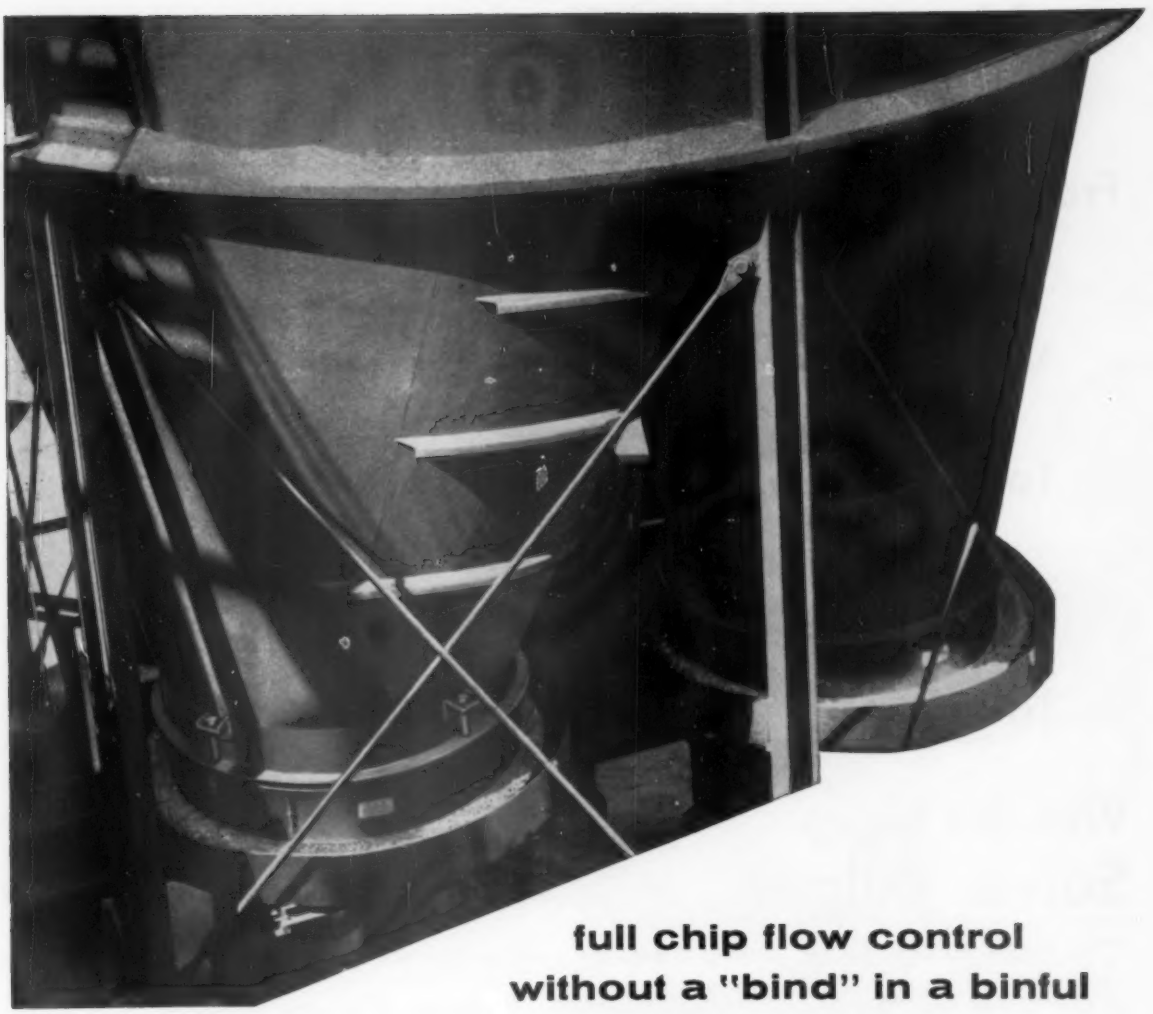
Crown Z Managerial Appointments

W. O. Beaton, resident mgr. of Crown Zellerbach Corp.'s Lebanon (Ore.) div. for the past year, becomes asst. resident mgr. at the Bogalusa, La. pulp and paper mill. **Clarence E. Englund,** power plant supt. at the St. Helens (Ore.) div. since 1958, transfers to the Lebanon div. as resident mgr. **John J. Goss,** asst. resident mgr. of the Gaylord div. plant at Bogalusa, becomes asst. resident mgr. at CZ's big Camas, Wash. plant.

Loren V. Forman, West Coast gen. mgr. for Scott Paper Co., has been named executive asst. to **Paul C. Baldwin,** vice pres. of production, engineering and research. Mr. Forman joined Scott Paper in 1950 as staff director of pulp utilization and has held various other positions since that time. His former position at Everett, Wash., will be assumed by **Roy L. Davis,** exec. vice pres. of Compania Industrial de San Cristobal SA Mexico, a Scott affiliate; Mr. Davis' Mexican duties will be assumed by **Henry Godshall Jr.,** mgr.

Borden Chemical promotions: **Francis W. Linehan,** formerly western operations sales mgr. for Borden Chemical Co., a division of The Borden Co., promoted to district mgr. at Seattle, Wash., responsible for sales and manufacturing in that state and Canada; **John W. Runkel,** with the



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without a "bind" in a binful

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Converting Mill . . .

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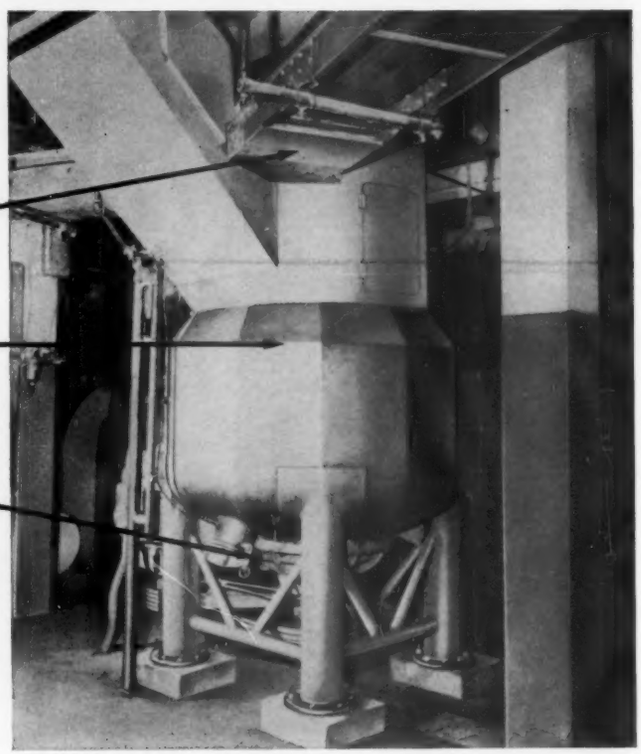
To Pump*

To Pulp Mill



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Solvo® Pulper

The Model 2U Solvo Pulper, playing a dual roll at Bird & Son, Inc., East Walpole, Massachusetts, has sharply reduced previous material handling costs. It is operating continuously under automatic control as both a material handler and a pulper. Boxboard broke from the converting machines is delivered by conveyors to the Solvo which simultaneously pulps and pumps it to the pulp mill. The units' single 50 HP motor handles both pulping and pump-away demand at a 24 ton/day rate.

This is one of a wide variety of Solvo Pulper applications. Others include de-ink cooking, dry end broke handling, paper machine furnish pulping, transfer of high yield cooked chips to refiners as well as the normal pulping of broke, wet strength and waste paper. Units are available for any capacity requirement.

*The pulping element, extractor plate and stock pump are one rotating assembly.

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NASHUA, NEW HAMPSHIRE
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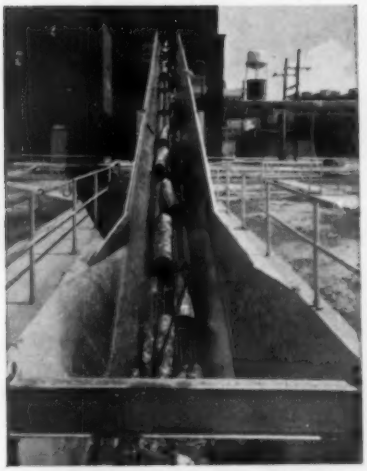
Flume system saves $16,000.00 per year for Masonite

A shortage of water didn't stop Masonite Corporation from using a flume system with tremendous success. The system is cutting log-handling costs by more than $16,000 per year by simply floating logs from yard to mill.

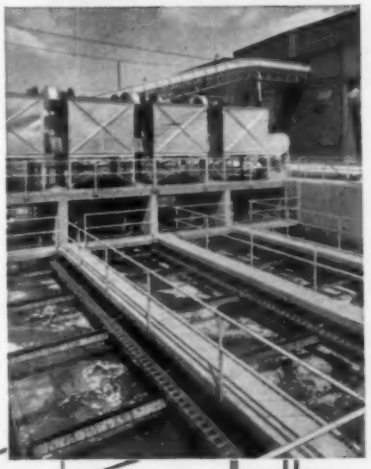
Heart of Masonite's flume system, Rex Chain and Bucket Grit Collectors and Rex Traveling Water Screens, makes it possible to re-use existing water over and over again—solving the water shortage problem and actually cutting water usage costs. The sand separating basins and screens remove 600 cu. ft. per hour of harmful sand and 3400 cu. ft. of bark per hour from the flume water. The entire system handles 60,000 gallons per minute.

LOW OPERATING AND MAINTENANCE COSTS, LONG LIFE

Rex Traveling Water Screens and Grit Collectors are easily installed in concrete channels behind the jack ladders in the flume system. They are ruggedly built —are designed to assure lowest possible operating costs and exceptionally long life. For complete information, write CHAIN Belt Company, 4691 W. Greenfield Ave., Milwaukee 1, Wis.



One of two 100-ft. Rex Log Ladders which carry logs from flumes to mill. System handles 44 carloads of logs daily.

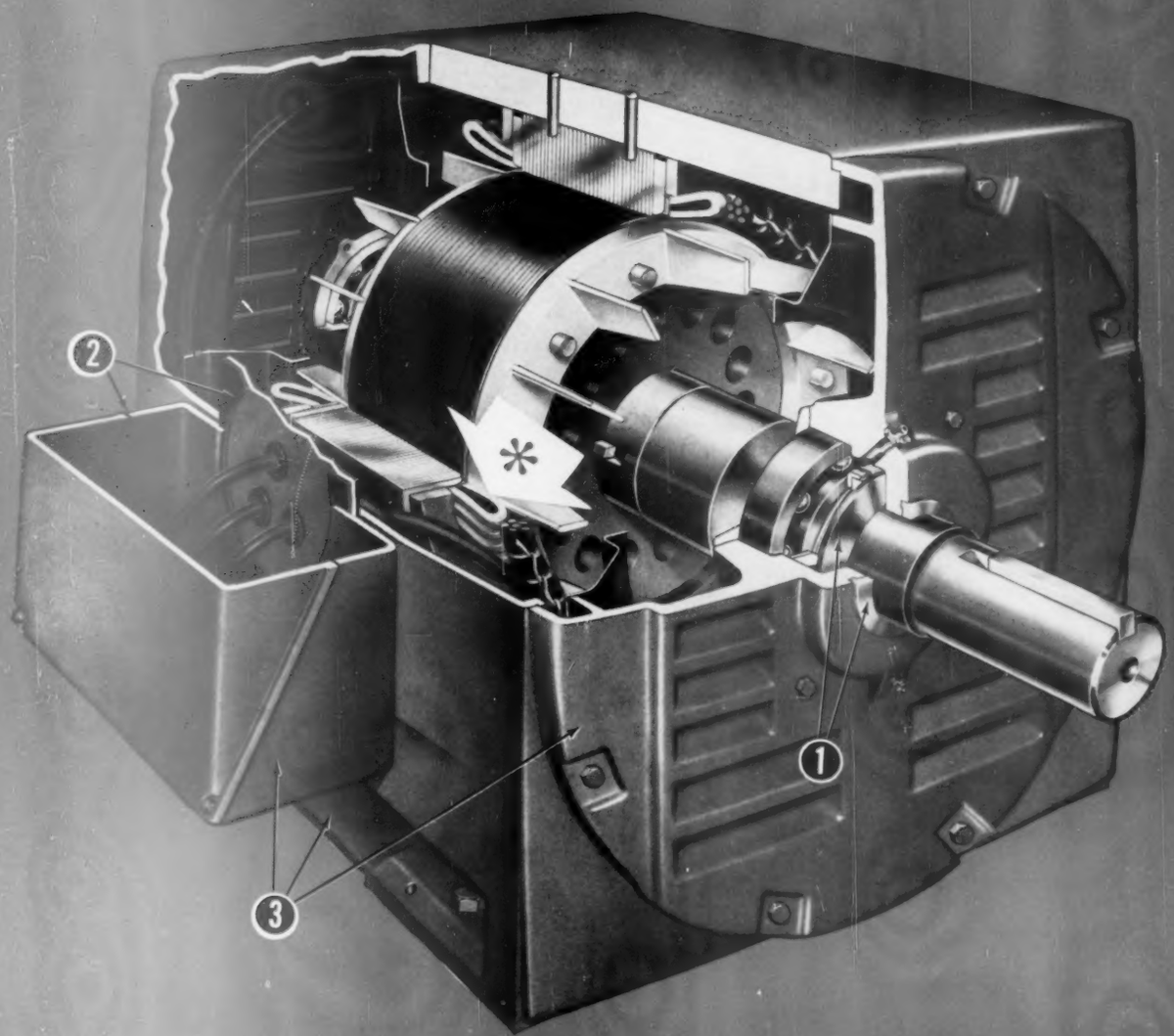


Rex Grit Collectors (left) and Rex Traveling Water Screens (below) in flume system used by Masonite Corporation, Laurel, Miss. Rex equipment is designed to remove pump-damaging debris from flume water coming from two flumes, each approximately 800 ft. long, 12 ft. wide and 7 ft. deep.

REX®
CHAIN BELT COMPANY

General Electric's ***CUSTOM '8000' means . . .***

MOTORS SPECIALLY DESIGNED FOR PULP AND PAPER MILLS



❶ Water-resistant bearing seals guard Custom '8000'* motors against damage from moisture and chemicals encountered in the pulp mill, bleach plant and other stock preparation areas.

❷ Extra large cast-iron conduit box has gaskets at the split, and between frame and box to seal out moisture. Leads enter box through a steel plate fitted with rubber grommets to complete moisture-proofing.

❸ Frame, end shields, and conduit box are cast iron. All other parts and hardware are specially treated for corrosion resistance to provide maximum reliability for pulp and paper applications.

IN ADDITION TO THE SPECIALIZED MOTOR FEATURES mentioned above, General Electric Custom '8000' motors offer these superior "standard" features: easily-removable, lightweight, flat end shields simplify motor maintenance; positive-purging lubrication system increases bearing life—prevents grease leakage along shaft (new sleeve bearing design also available); pre-wound stator core assures uniform high performance; acoustic design reduces motor noise level.

CUSTOM '8000' MOTORS are manufactured to the rigid quality specifications General Electric has adhered to for over 80 years. However, with the implementation of advanced design and manufacturing techniques, General Electric today can accurately and economically customize motors to your specific requirements through utilization of motor components engineered exclusively for pulp and paper applications.

* Trademark of General Electric Co.

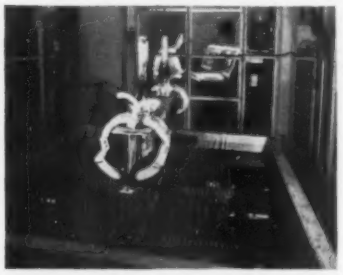
Progress Is Our Most Important Product

GENERAL ELECTRIC

EXCLUSIVE

POLYSEAL* INSULATION SYSTEM LENGTHENS MOTOR LIFE

General Electric's new Polyseal insulation system is designed to give maximum motor protection in pulp mills, bleach plants and other stock preparation areas. Polyseal insulation is a system built to assure superior mechanical, thermal, voltage and environmental endurance. Form-wound insulation system utilizes silicone rubber tape reinforced by glass fabric materials and vulcanized, after coil wrapping, to provide a positive seal against moisture and contaminants.



POSITIVE MOISTURE PROTECTION is assured by "under water" production line tests. For example, 2300-volt, form-wound Polyseal coils are completely immersed in water and "hi-potted" at 8000-volts to prove that the insulation system is absolutely sealed.

CALL YOUR GENERAL ELECTRIC APPARATUS SALES OFFICE

for full information on CUSTOM '8000' motors for the pulp and paper industry, or write for Bulletin GEA-6865, to Section 884-10, General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

PULP & PAPER

Strictly Personal

Oregon Forest Products Laboratory prior to joining Borden Chemical in 1950 becomes district mgr. at Springfield, Ore., responsible for sales and production in Oregon, southern Idaho and Wyoming; **B.B. Butler**, who joined the firm in 1946, becomes district mgr. at Los Angeles and will coordinate activities of the West Coast engineering dept. in addition to being responsible for sales and production in California. . . . **Lawrence Gillen** becomes mgr. for foundry products sales at Electric Steel Foundry Co., Portland, Ore. Formerly district engineer in the Columbia River area, he will supervise sales of all earth-moving equipment and construction products, log grapples, swage presses, logging rigging, sawmill equipment, stainless pipe fittings and a wide range of stainless and high alloy castings. —Louis H. Blackerby.

Northeast

Roy D. Rivers has joined the M. W. Kellogg Co. pulp and paper group as project manager. He supervised start-up and helped train operators at new mills in India, Peru and Brazil. His most recent jobs was mill manager for Champion Celulose, S.A. at São Paulo, Brazil. . . .

Dr. Albert P. Yundt, formerly technical director of Union Bag Camp Paper Co. at Franklin, Va., has joined Bird & Son as assistant to the president. . . . **Edgar Rothschild** is sales coordinator for the Jamesbury Corp. . . . **Derry Akeroyd** is now asst. mgr., No. 8 mill, Crocker, Burbank & Co., Association. He has been sales engineer with Beloit Iron Works for six years, before that had been production mgr., Personal Products Corp. . . .

Edward R. Frisby has been named vice president, industrial relations, Oxford Paper Co. . . . **Fred A. Clough Jr.**, who joined Oxford in 1959 as asst. dir. of public relations, moves up to dir. of public relations succeeding **T. F. Spear**, who has retired. . . .

John J. McDonald has been promoted to general manager of Brown Co's. Sulphite Pulp and Flox Div. He had previously been manager of pulp sales and manager of export sales, he succeeds **Hugh D. Jordan** who was recently elected treasurer. . . . **C. A. "Buster" Cordwell** steps up as sulfite production manager at Brown. . . . **Francis X. Guimond**, manager of pulp manufacturing at Brown has resigned to join Parson & Whittemore-Lyddon with headquarters in the British office of the pulp and paper mill project division in London. . . .

David Neill is now manager of roll grinder sales for Farrel-Birmingham Co., Inc., succeeding **Robert J. Horning** who transfers to the company's European office as assistant manager. . . . **Robert K. Blackburn**, formerly an engineer with Beloit Iron Works, has joined S.D. Warren as general maintenance supt. . . .

Bruce W. Morrison is now area sales manager for Westinghouse Electric Corp's. Boston district office. . . . **"Lew" Paine** is now paper mill engineer, St. Croix Paper Co. . . . **Stephen Petley** succeeds him as supt. of maintenance and **Harry Tiller** joins the control dept. as quality control engineer. . . .

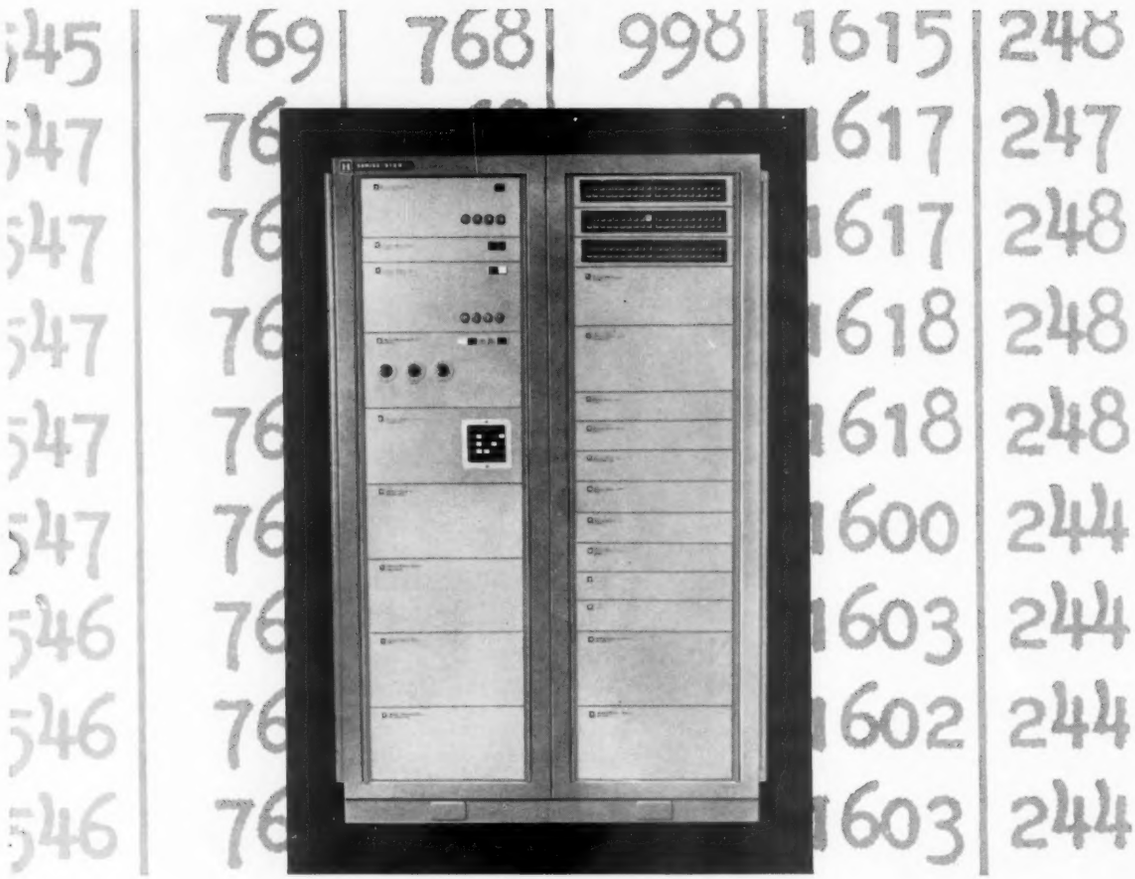
Alexander Black has been named manager of Canco Division's Marketing division, American Can Co. . . . **Charles H. Goodwin**, asst. sales manager, Columbia Box Board Mills, Inc., died August 13. . . . **Vincent "Jim" Gilpin, Jr.** is now sales manager for Downingtown Paper Co., paperboard div.

Edmund K. Nock has been promoted to manager-marketing of General Electric's small steam turbine dept. . . . **Arvin W. Harrington**, formerly eastern regional sales mgr., Alloy Tube Div., The Carpenter Steel Co., hac been named manager of distribution. . . . **Harry A. Hauser** succeeds him as eastern regional sales mgr. . . .

Dr. Harold M. Sonnichsen has joined the Dewey and Almy Chemical Div., W.R. Grace Co., as director of fiber and saturant research in D&A's polyfibron div. He formerly was a vice president and research director of Fermacel Div., J&J; is an authority on impregnated fibers. . . . **G. Stephen Glaser** is sales rep of the eastern district of the Silicone Products Dept., General Electric Co. . . . **William B. Whiting** is now division general manager responsible for Container Corp. of America's Philadelphia and Chattanooga paperboard mills. . . . **William Erskine** succeeds him as general manager of the Philadelphia mill.

John R. Jones has been named New York-New England district sales manager for American Potash & Chemical Corp. . . . **Lee Tarricone** is now sales manager, General Kinetics Corp. . . . **J. Justin Basch** has been elected second vice president and **William A. Baltzell** as vice president, Oakite Products, Inc. . . . **Gustav A. Hoffman** has been elected vice president, sales, Walworth Co. . . .

Osgood V. Tracy, formerly president of Esso Standard, division of Humble Oil & Refining Co., has been elected a director and executive vice president of W.R. Grace & Co. and will be in charge of chemical business of Grace. **John H. Smith** has been named technical sales representative for New England and Eastern Canada for the paper division of



The Series 3120 cubicle occupies less than nine square feet of floor space and normally requires no special air conditioning.

USE THIS ALL-PURPOSE LOGGER-SCANNER AS THE "WATCHDOG" OF YOUR ENTIRE PROCESS

The Honeywell Series 3120 logger-scanner can keep your pulp and paper processes under constant surveillance, give you a wealth of highly accurate, up-to-the-minute, process data, and notify your operators when something goes wrong.

The logger receives electrical signals representing temperature, pressure, flow and other variables from primary sensing devices located throughout the mill. These signals are converted into immediately usable data on a typewritten log sheet. Readings are made directly in terms of degrees, pounds, cubic feet per hour, etc.—no computations are required. The unit can log up to 120 points, with accuracy of $\pm 0.1\%$ of reading.

The scanner monitors seven points per second. When it detects an off-normal point, it sounds an alarm, lights a point-identification light, and prints the time, point number, and off-normal value on a separate alarm record.

With the Honeywell logger-scanner, you get complete process data while it is still meaningful, so that all variables can be easily correlated for best possible process performance. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

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There are four ESKAR Waxes you will want to investigate if you use wax in your operations. Each one of these waxes has excellent stability, high strength and good odor. Here is the lineup: ESKAR R-50—For special high blocking point, high gloss coatings. Frequently may be substituted for part of micro in blends. ESKAR R-40—For liners and overwraps where sealing strength is important. ESKAR R-35—For saturation waxing and carton applications. ESKAR R-25—For dry waxing, as a process ingredient and for miscellaneous uses.

Get more information on ESKAR Waxes plus technical assistance from wax specialists. Just call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from **STANDARD** *and you get it!*

the Kelco Co.

William R. Daragan is technical service representative for the chloralkali division of FMC Corp.—Maurice R. Castagne

Canada

Clifton J. Walker of E.B. Eddy Co.'s forestry engineering dept. has won the $500 cash award in the annual Bolton Award competition. . . .

James Hundevad, formerly woods manager for the Smooth Rock Falls, Ont. operations of Abitibi Power & Paper Co. Ltd., has been named to a similar post with Manitoba Paper Ltd., an Abitibi subsidiary at Pine Falls, Man. Succeeding Mr. Hundevad in Ontario is **G.W. (Cy) Mundy**, who joined Abitibi at Iroquois Falls, Ont., in 1944 and during the intervening years has held various woodlands positions at Smooth Rock Falls.

Norman English, for many years gen. mgr. of logging for Powell River Co. Ltd. and one of British Columbia's best known and busiest logging executives, died suddenly while swimming late in July. He was 69 and a native of Wisconsin. . . .

James Gow Wyllie has been named vice pres., finance, St. Lawrence Corp. Ltd. in Montreal. This is a new position. Mr. Wyllie was formerly asst. gen. mgr. and a director of Bowaters Newfoundland Pulp & Paper Mills Ltd., as well as sec.-treas. of Bowater Corp. of North America Ltd. Some time ago he was asst. internal auditor of Howard Smith Paper Mills, Ltd. . . .

W.N. Hall, former president of Dominion Tar & Chemical Co., has been named president of Howard Smith Paper Mills Ltd., replacing **D.S. Abbott**, who has resigned owing to ill health; however he will continue as a director of the company. **H.E. Mason**, formerly exec. vice pres., has been appointed gen. mgr. in addition to his other duties, and he has been named to the executive committee. (Dominion Tar & Chemical controls the Howard Smith organization.) . . .

W.D. Kerr, formerly supervisor of Fraser Companies Ltd.'s pilot plant, has succeeded **Dr. B.J. Trevelyan** as director of research and development for the company at Edmundston, N.B., according to announcement by **W.A. Ketchen**, vice pres., technical services. . . .

J.S. Gilham has been named mgr., technical services, at Westminster Paper Co. Ltd. **C.N. Hager** is now plant mgr., Crabtree Mills, div., and **M.A. Bailey** is asst. plant mgr. The appointments were announced by **John Ashby**, exec. vice pres. Max Bailey was for many years machine room supt. at New Westminster, B.C. . . .

Hugh Hodgins, Director of Crown Zellerbach Canada Ltd.

Vice pres. for timber operations for the past two years, he has been associated with the firm since 1944, with the exception of 1950-57, when he operated a private forestry consulting service in Vancouver, B.C. He is now a member of the CZ Canada board.

A native of Saskatchewan, Mr. Hodgins was with the British Columbia Forest Service prior to entering private industry. He is president of the Canadian Institute of Forestry and of the Western Forestry & Conservation Assn.

JACKSONVILLE BLOW PIPE COMPANY announces the

NEW K-C Model of the marvelous MONTGOMERY BLO-HOG (pat. pending)

ESPECIALLY DESIGNED FOR PAPER MILL SERVICE

- Minimum of down time and maintenance.
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MAKES LIGHT WORK OF HANDLING ROLLS

The revolutionary new NIM-COR Air Shaft takes the work and waste out of mounting paper rolls on winding equipment. The rugged, precision-built shaft slides easily into the roll core — then expands under air pressure to provide a positive, multi-contact grip. Install or remove in seconds. No slip . . . no vibration. Uniform tension control assures true wind. Available with Expanding Sleeve for coreless and narrow core operation. All units custom built to fit any roll, any equipment.

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in every size and filling.
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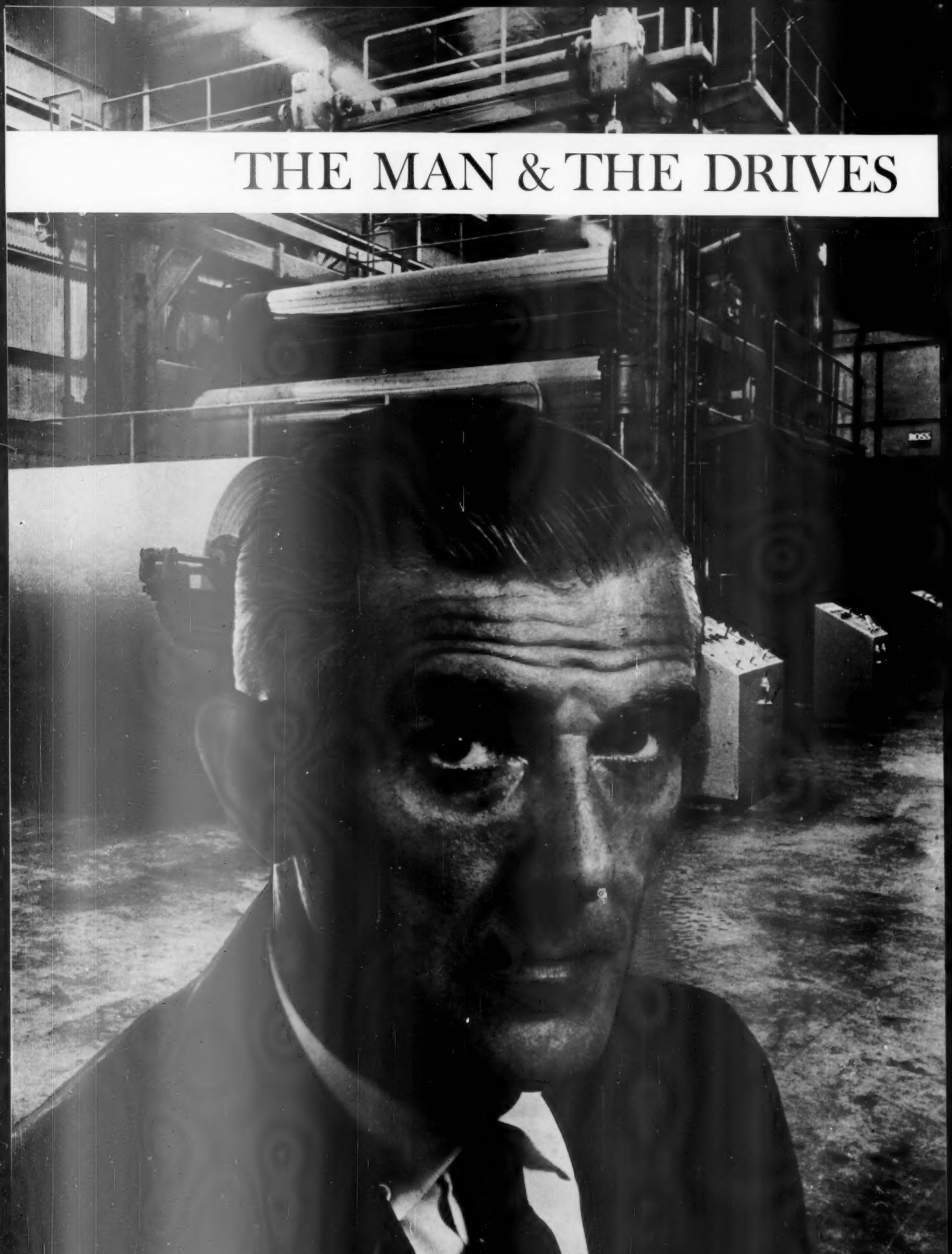
APPLETON, WISCONSIN est. 1883

THE MAN & THE DRIVES



FROM WESTINGHOUSE

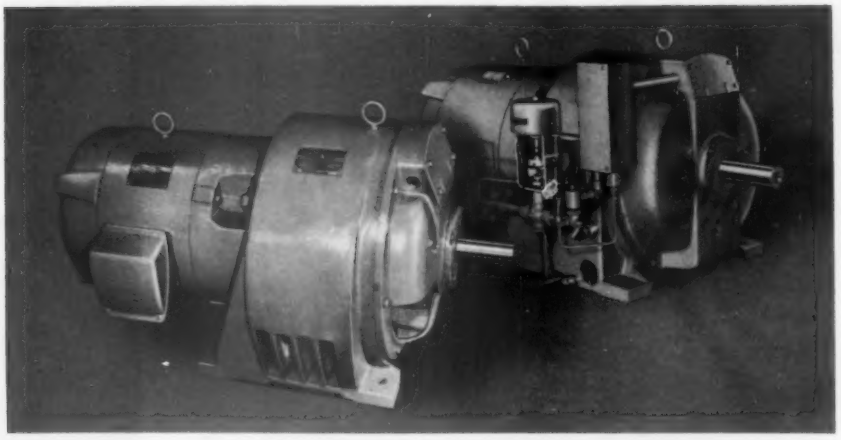
Mr. Westinghouse and MagnaFlow Drives Bring Simple Solution to Speed Control Problems, Save Money and Space, Too!

Westinghouse MagnaFlow* electromagnetic drives—air or liquid cooled—provide infinitely adjustable speeds from standstill to top speed with regulation guaranteed at ±2% of top speed over a 17-to-1 speed range (even closer regulation when desired). Control is smooth and stepless.

These compact drives, having a minimum number of parts, are built for rough, trouble-free service. The unique electromagnetic coupling maintains adjustable output speed without the use of pulleys, belts, brushes, commutators, slip rings or rotating windings. A rugged Life-Line® "A" motor supplies reliable a-c drive power. No power converting equipment needed—only a small, static exciter and an operator's control station. Initial cost is low; installation—easy and inexpensive.

Your Man from Westinghouse is ready now to help you apply MagnaFlow drives . . . and any other drives you may need. Call him . . . or write for a copy of Westinghouse MagnaFlow Electromagnetic Drives (B-7875), Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. You can be sure . . . if it's Westinghouse. J-22162-R

*Trade-Mark



MagnaFlow drives—air cooled (foreground) and liquid cooled—are available in various horsepower ratings for winders, conveyors, fans, pumps, extruders and other machinery in all industries.

Westinghouse

PULP & PAPER

Strictly Personal

Gordon F. Harrison has been named director of industrial relations, St. Lawrence Corp. Ltd. in Montreal. He was formerly with Canadian General Electric and the John Inglis Co. He continues as a vice pres. of Hinde & Dauch Paper Co. of Canada Ltd., which is affiliated with St. Lawrence. . . . **E.L. Neal,** president and gen. mgr., Gaspesia Sulphite Co., Ltd., has been elected a director of Anglo-Newfoundland Development Co. Ltd. He is a former mill mgr. of A.N.D. **Robert E. Mombery** has been appointed controller for A.N.D., according to **T.M. Hopkins,** treas. . . .

M. MacLaggan has been appointed asst. to the mgr. of woodlands for Abitibi Power & Paper Co. Ltd.; **F.L. Stevens** acting divisional woodlands mgr. for the Lakehead Woodlands div., and **A.V. Pingree** asst. divisional woodlands mgr. in that division. Announcement of these promotions was made by **E.E. Grainger,** mgr. of woodlands, who recently succeeded **C.B. Davis,** retiring vice pres., as director of the firm's over-all woodlands operation. . . .

A woodlands operations advisory panel has been formed by the Pulp & Paper Research Institute of Canada. Members include: **E.E. Grainger,** gen. mgr., woodlands, Abitibi Power & Paper Co. Ltd.; **W.F. McColm,** vice pres., woodlands, Howard Smith Paper Mills Ltd.; **Gordon G. Cosens,** vice pres. and woodlands mgr., Kimberly-Clark Canada Ltd.; **Gordon Godwin,** gen. mgr., woodlands, Ontario Paper Co. Ltd.; **F.A. Harrison,** vice pres., woodlands, Canadian International Paper Co.; **E.L. Howie,** chief forest engineer, Fraser Companies Ltd.; **J.D.B. Harrison,** director, Forestry branch, Dept. of Northern Affairs & National Resources, and **Dr. L.R. Thiesmeyer,** exec. secretary and president, Pulp & Paper Research Institute (ex officio). . . .

Some other appointments at Anglo-Newfoundland include: **A.R. Leger,** formerly gen. supt., operations, to be asst. to the mill mgr.; **G.P. Chinn,** formerly control supt., to be gen. supt., operations; **R.I. Howard,** formerly asst. control supt., to be control supt. . . .

I.F. Willment has been named sales mgr. for J. C. Wilson Ltd.'s sales subsidiary, North River Paper Ltd., according to announcement by **Arthur Welch,** vice pres. of marketing. . . . **W.H. Birchard,** who has held several important positions with Fraser Companies Ltd. in New Brunswick and was at one time chairman of the Technical Section, CPPA, has been presented with an engraved gold watch in recognition of his 25 years of service with the company. The formal presentation was made by **W.A. Ketchen,** vice pres., technical services.

Andrew M. Swan has been named resident mgr., Richmond Pulp & Paper Co. Ltd. at Bromptonville, Que. He was formerly administrative asst. of the Industrial Development Bank, is an engineer by profession.

Technical Section Honors Andrews at Banff Meeting

An honarary life membership in the Technical Section, CPPA, was awarded **Dr. I. Harry Andrews** during the annual summer meeting in the Canadian Rockies. He is vice president, planning, research and development, for MacMillan, Bloedel & Powell River Ltd., Vancouver, B.C.

felt facts
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CUSTOMER SERVICE LABORATORY
Here's a specially equipped and staffed department just for you. We make physical and chemical analyses of worn felts, check for bacteria damage, offer felt washing suggestions or recommend chemical treatments if needed—all for improved felt performance.

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Dryden = Quality and Service

Papermakers know that Dryden is synonomous with quality. But Dryden is also known for complete and efficient service.

Dryden maintains boxcar inventories of sulphate pulps—ready to go at a moment's notice…Cars are constantly on the move all over the country and, in an emergency, can be rapidly diverted…Delivery can be made to any destination in the East in a maximum of ten days, and much more quickly in the Midwest – due to Dryden's strategic location on the CPR east-west trunk line.

Dryden also offers a special service to those who use more than one grade of Dryden pulp: mixed cars with two or more grades help keep your inventories at a minimum.

And, of course, technical information and service are always available whenever the need arises. Order a trial shipment of Dryden Sulphate Pulp—and get the extra bonus of quality and service.

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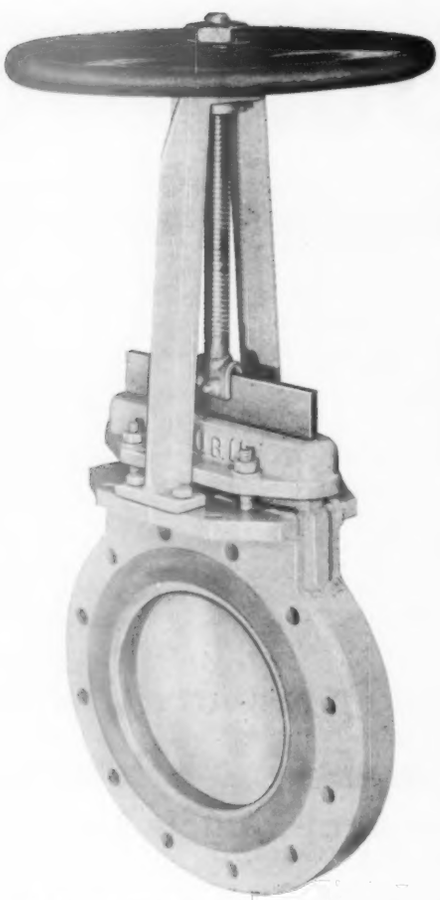
EVERY DAY THE COST OF A DeZurik Valve GOES DOWN!



With manual, on-off and positioning operators, in a wide variety of metals. For more information write for Bulletin 300.

And it starts the first day! DeZurik Knife Gate Valves cost less to install; because of their light weight they need no extra piping supports. Yet their rugged construction withstands piping strain and line pressure without distortion.

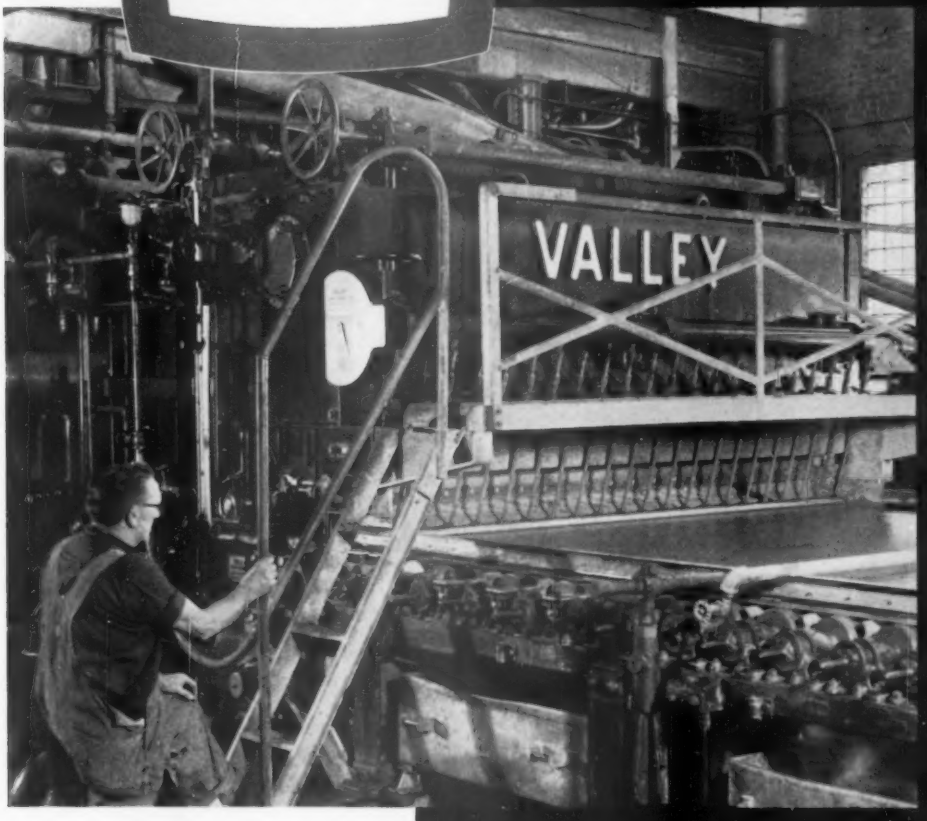
Every day they're in use, DeZurik Valves continue to reduce costs with their freedom from the usual maintenance expenses. The large yoke head provides a liberal machined surface for the operating nut . . . the stainless steel stem has double-pitch threads for less wear . . . the round port bottom eliminates corner cavities where stock can pack . . . all these features point to reduced maintenance with DeZurik Knife Gate Valves.

Add to this the long life . . . and the low *original* cost of DeZurik Gate Valves and you get unsurpassed valve value!

DeZURIK CORPORATION
SARTELL, MINNESOTA

another new INLET *and* HEADBOX

by . . . VALLEY



No. 10 machine THILMANY PULP and PAPER CO.

Kaukauna, Wisconsin

Since this unit was installed in 1959, two additional units have been purchased for Thilmany's Machines.

write . . . VALLEY

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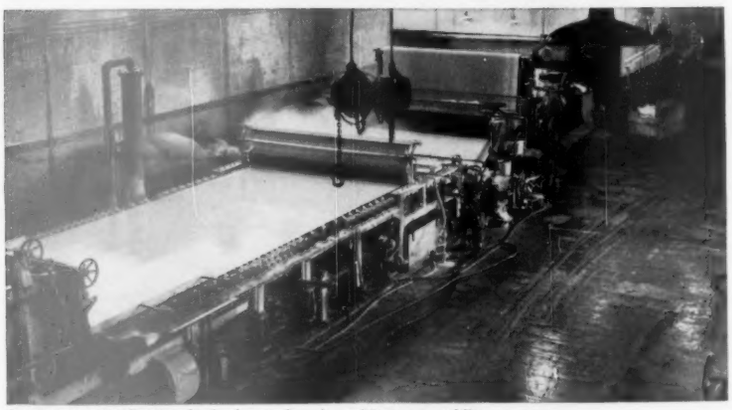
Subsidiary of Allis-Chalmers Mfg. Co.

West Coast Representative: E. A. Berry, P. O. Box 958, Longview, Washington

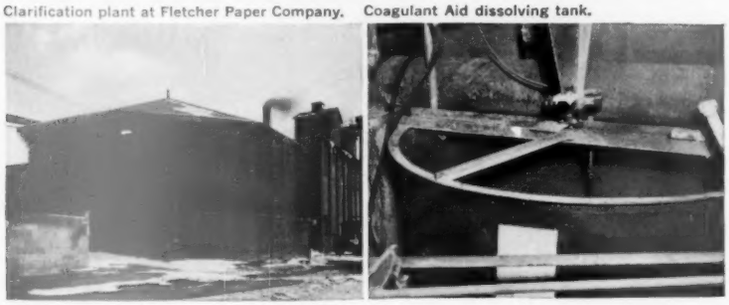
Canadian Representative: Pulp and Paper Mill Association Ltd., P. O. Box 850, Station "O", Montreal 9, Quebec

HAGAN COAGULANT AIDS
give Fletcher Paper Company clear water without filters



Good water clarification is the key to keeping white paper white.

Clarification plant at Fletcher Paper Company. Coagulant Aid dissolving tank.



Quick Case History—reading time 62 seconds

THE PLANT: Fletcher Paper Company, Alpena, Michigan, clarifies Thunder Bay River water in an upflow unit. Without filters, poor turbidity removal or floc carryover adversely affects paper quality and cannot be tolerated.

THE PROBLEM: The plant had been using alum and activated silica. Results were not uniformly satisfactory. There was carryover of floc and suspended matter to the clear well. Pump and line maintenance costs were high.

THE SOLUTION: A combination of Hagan Coagulant Aids has solved the problem. Easy to feed (this plant is using the slurry method) Hagan Aids are producing a larger, tougher floc that settles fast. Clarification is more complete and paper production is no longer handicapped by poor water quality.

RESULTS: Regardless of raw water changes, water quality in the plant is good. Carryover of floc and suspended matter has ceased, in fact, one can tell whether a dime at the bottom of the 8-foot deep clear well is heads or tails. Since Hagan Coagulant Aids are in use, maintenance costs have returned to normal. Best of all, chemical treatment cost has been cut by nearly 50%.

WANT MORE INFORMATION on how your operation might benefit from the use of Hagan Coagulant Aids? A letter or phone call will bring complete information.

Ask for Bulletin HSP-919.

HAGAN
CHEMICALS & CONTROLS, INC.
HAGAN CENTER, PITTSBURGH 30, PA.

HAGAN DIVISIONS: CALGON CO.—HALL LABORATORIES—BRUNER CORP.

F.H. Britton has been named solicitor to MacMillan, Bloedel & Powell River Ltd., Vancouver, B.C. His appointment was announced by Chairman of the Board **C.V. Clyne.** Formerly in the law dept. of the Canadian Pacific Railway, Mr. Britton will be in direct charge of all legal affairs concerning MB&PR . . .

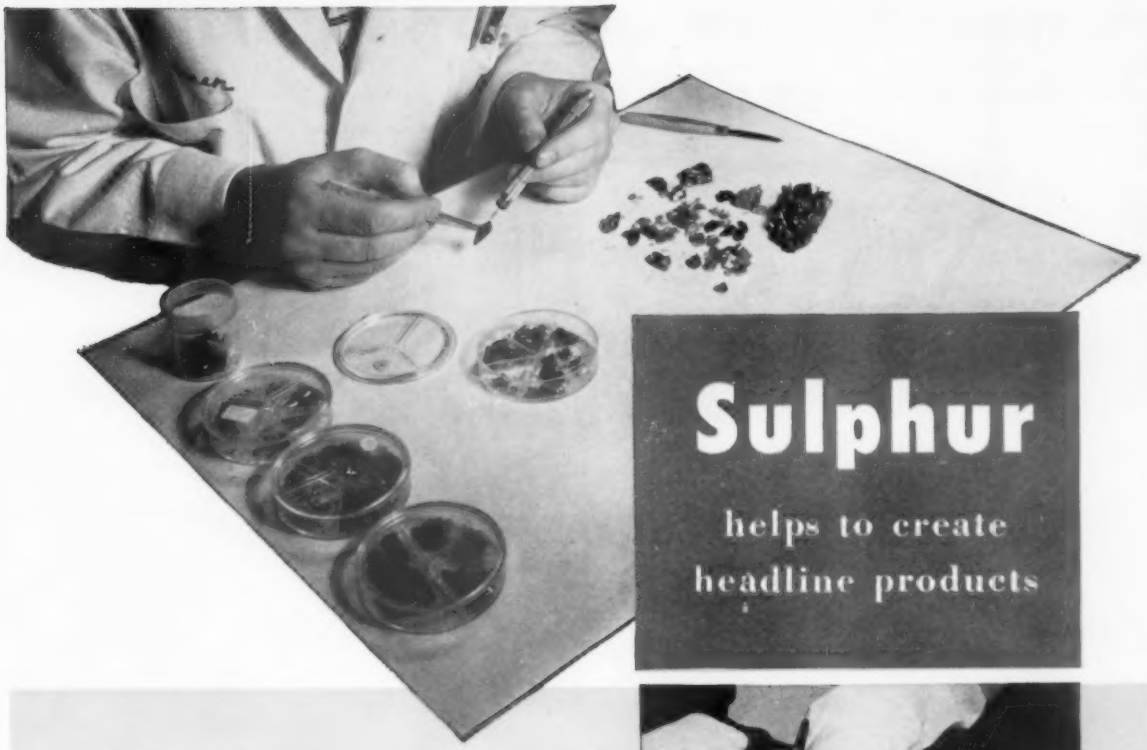
Dr. C. Syrach Larsen, Famed Danish Forester, Visits B.C.

He is shown here with his daughter, **Kirsten,** a graduate forester, on arrival at the Gold River Valley area of Vancouver Is., where he will help establish a modern "scientific genetic silvicultural tree-breeding station". The station is to be operated by Tahsis Co., a subsidiary of East Asiatic Co.

Dr. Larsen believes that trees should be bred by gradually establishing the strain through grafting and other means that will improve the stock of second growth. Tree breeding, he says, is particularly important in development of pulpwood forests. Dr. Larsen heads a forest research station near Copenhagen that has been in operation more than 150 years.

Alex Brokenshire Safety Director for New B. C. Mill

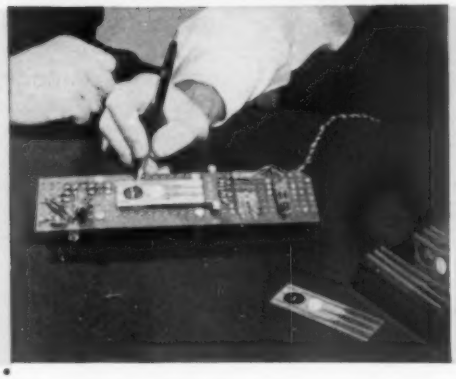
When Celgar Ltd.'s big new bleached kraft mill goes on stream at Castlegar, B.C., late this year, he will serve as safety coordinator. For the past 20 years Mr. Brokenshire has been employed by Consolidated Mining & Smelting Co. Ltd., for the last seven years at Trail, only a few miles from Castlegar.



Sulphur

helps to create headline products

CdS • • • *a new concept in field-effect transistor design*



General Motors Research Laboratories has recently announced the application of a new transistor material ... the cadmium sulphide crystal which offers several distinctive values over the single type atomic material. Its outstanding characteristic is that it is controllably sensitive to and affected by light and other radiations.

CdS provides another interesting development where Sulphur is importantly in the picture ... a development that may have far-reaching effects in the broad field of electronics.

Sulphur and its many derivatives, either directly or indirectly, have a part in the creation of countless products, adding to the strength of our economy. Our business is to produce Sulphur—molten as well as solid—and have it available in sufficient tonnages at several departure points to serve any plant in the United States or Canada. Supplementing this basic policy, we are developing centralized distribution centers for quicker service.

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Oriskany
WATERBURY FELTS,

has not been sold!

This distinctive trade mark identifies the fine quality paper-makers' felts that have been produced by H. Waterbury and Sons Company, Oriskany, New York, since 1869.

Recent trade magazine notices regarding the purchase of a felt manufacturing company with a similar name by another felt producer have created confusion and misunderstanding among our customers. There is no affiliation between H. Waterbury and Sons Company and the mill that has been sold.

Oriskany Waterbury Felts are produced in our modern, domestically owned and operated mill under the careful supervision of our skilled American craftsmen. We publish this notice for the information of our valued customers.

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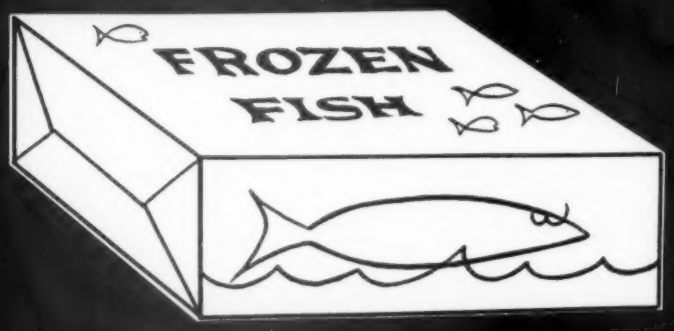
WATERBURY FELTS

H. WATERBURY and SONS COMPANY • ORISKANY, NEW YORK



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Waxed paper wrappings containing Unitane O-110 give products a clean, sanitary look and enhance their eye appeal on the shelf or at the counter. The opacity and sparkling whiteness of O-110 provide an excellent background for the printed message. Ask your Cyanamid Pigments representative for full details.

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William McMahan, vice pres., Canadian Forest Products Ltd., Vancouver, B. C., in charge of the Howe Sound Pulp div. as well as the company's timber and logging divisions, will preside at the Pacific Logging Congress in Vancouver in October. He is president of the PLC.

F. W. Buckley, chief engineer, Bathurst Power & Paper Co., told a meeting of the Engineering Institute of Canada at Montreal that a paper mill, of all industrial plants, probably has the best opportunity to produce cheap thermal power. At the same meeting, D. P. Eyness of Sandwell & Co., pulp and paper consulting engineers, described the Khulna newsprint mill in Pakistan recently completed under direction of the Canadian firm.

—Charles L. Shaw

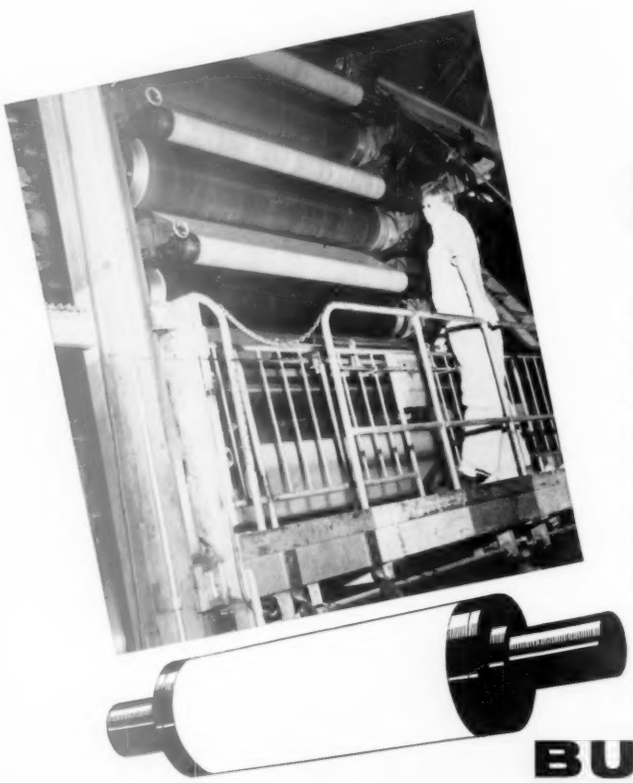
Abitibi Executive Changes

Several appointments have been reported in Toronto by **E.W. McBride**, vice pres. for manufacturing, Abitibi Power & Paper Co. Ltd.

T. Newman McLenaghen becomes mill mgr. at Manitoba Paper Co. Ltd., Pine Falls, Man. He was formerly asst. mgr. of the Pine Falls div. and succeeds **R.L. Fraser**, who is on special assignment at the Iroquois Falls div. . . . **J.H. Tremblay** is named asst. mill mgr. at Manitoba Paper, moving up from the post of gen. supt. He has been with the firm more than 45 years. . . .

J.F. Williams is named gen. supt. at Manitoba Paper to succeed Mr. Tremblay. He was formerly resident engineer at the Iroquois Falls (Ont.) div., a post in which he is succeeded by **D.D. Munro**, resident engineer at Manitoba Paper. . . . And **W.C.E. Wood** becomes Manitoba Paper resident engineer. His former post was as engineering and maintenance supt. for Abitibi Corp., Alpena, Mich. . . .

"He's in the back, working on some formula for dissolving pulp!"



GREAT NAMES
in the Paper Industry:
Riegel Paper Corp.

Butterworth Calender Rolls are used in this supercalender stack at Riegel Paper Corp., Milford, N. J.

Butterworth Rolls, used by the leaders in the Paper Industry, are made to specification and checked for hardness, smoothness, and density before delivery. You can see the difference in finer finishes, extra hours of service without turning down or refilling.

Furnished new or refilled for every calendering need. And you get Butterworth Rolls at competitive prices. Quotations on request.

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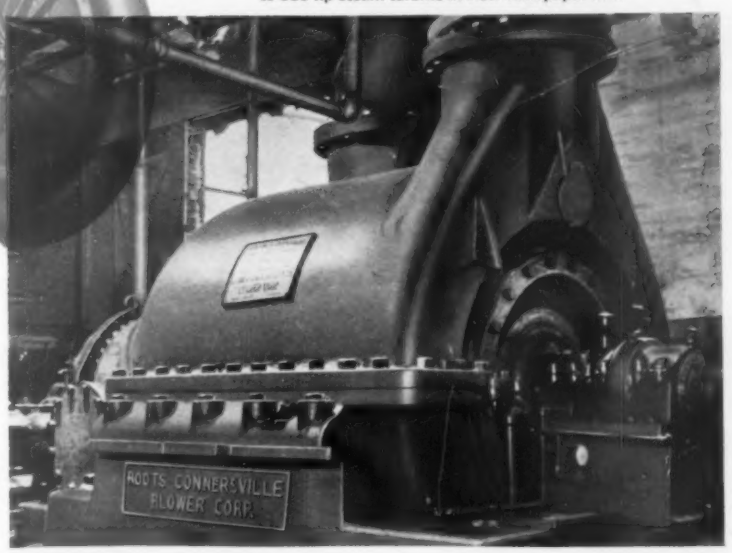
BUTTERWORTH

More than 60 years of Roll-Making Experience

WHY YOU SHOULD SEE ROOTS FIRST FOR ALL VACUUM REQUIREMENTS

ROOTS' "Dual-Ability" Offers Centrifugal and Rotary Positive Equipment

Roots Multistage Centrifugal Exhauster connected to 550 hp steam turbine in New York paper mill.



Roots Rotary Pumps supplying vacuum on large paper machine in Texas mill.

Roots Rotary Vacuum Pumps and Roots Centrifugal Exhausters are virtually free of maintenance because both are simple, rotative machines. However, each has distinct operating characteristics and each has an important, preferred application in certain paper mill operations. That's what makes Roots' "Dual-Ability" so important — because Roots offers **both** types to the industry.

Rotary vacuum pumps are constant volume, variable pressure machines; centrifugal exhausters (available with multiple nozzles) are essentially constant pressure, variable volume units. When Roots appraises your vacuum requirements, it is from the unbiased position of being able to recommend and supply the type best suited to your needs.

Hundreds of Roots Rotary Vacuum Pumps installed throughout the United States, Canada and other countries testify to their wide acceptance on paper machine requirements. In the centrifugal field, a Roots Multistage unit has been in service for 13 years supplying vacuum requirements for paper machines in a New York mill. Roots Singlestage Centrifugals are being utilized for specific vacuum applications on several U.S. and Canadian paper machines.

The next time you consider vacuum equipment, talk first to ROOTS — first in the field of air and gas handling.

Write for Bulletins 120-B-14 (Centrifugal Exhausters) and VP-158 (Rotary Positive Vacuum Pumps).

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Rotary Positive Blowers & Meters • Gas Pumps • Vacuum Blowers • Spiraxial® Compressors • Centrifugal Blowers

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14" 300 lb. gate valve slated for a large petro-chemical plant, is being worked on one of Aloyco's battery of new Bullards.

Advanced machines... tools...test facilities expand Aloyco Valves' range of service

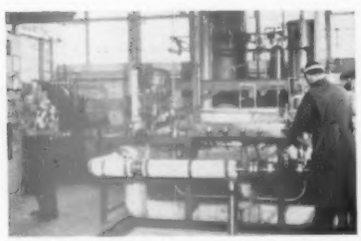
Constant change and improved techniques in modern fluid handling, pose a real challenge for valve manufacturers.

To meet these demands, Aloyco is constantly adding new facilities, some of which are pictured here.

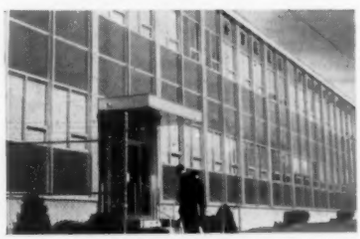
For example, Aloyco Stainless Steel Valves are now available in sizes up to 24", pressures up to 2,500 lbs. at 650°F.

While these new facilities have improved and expanded the quality and usefulness of our entire line, they are particularly important, for example, in the manufacture of valves for the nuclear and missile fields.

For advanced knowledge and ideas plus the equipment to carry them out – take your next valve problem to the specialists: Alloy Steel Products Company, **1316** West Elizabeth Avenue, Linden, New Jersey. 9.8



One of finest hot test loops in the nation checks out valves at up to 2500 psi, 650°F. Hot tests can spot trouble that would otherwise be revealed only after months of line service.



New multimillion dollar Aloyco plant combines new production tools, test facilities, sales, administration, research and development offices and labs into single integrated unit.

Boroscope examination (in pressurized clean room) of specially made nuclear valves follows the application of dye penetrant.

ALLOY STEEL PRODUCTS COMPANY

LINDEN, NEW JERSEY

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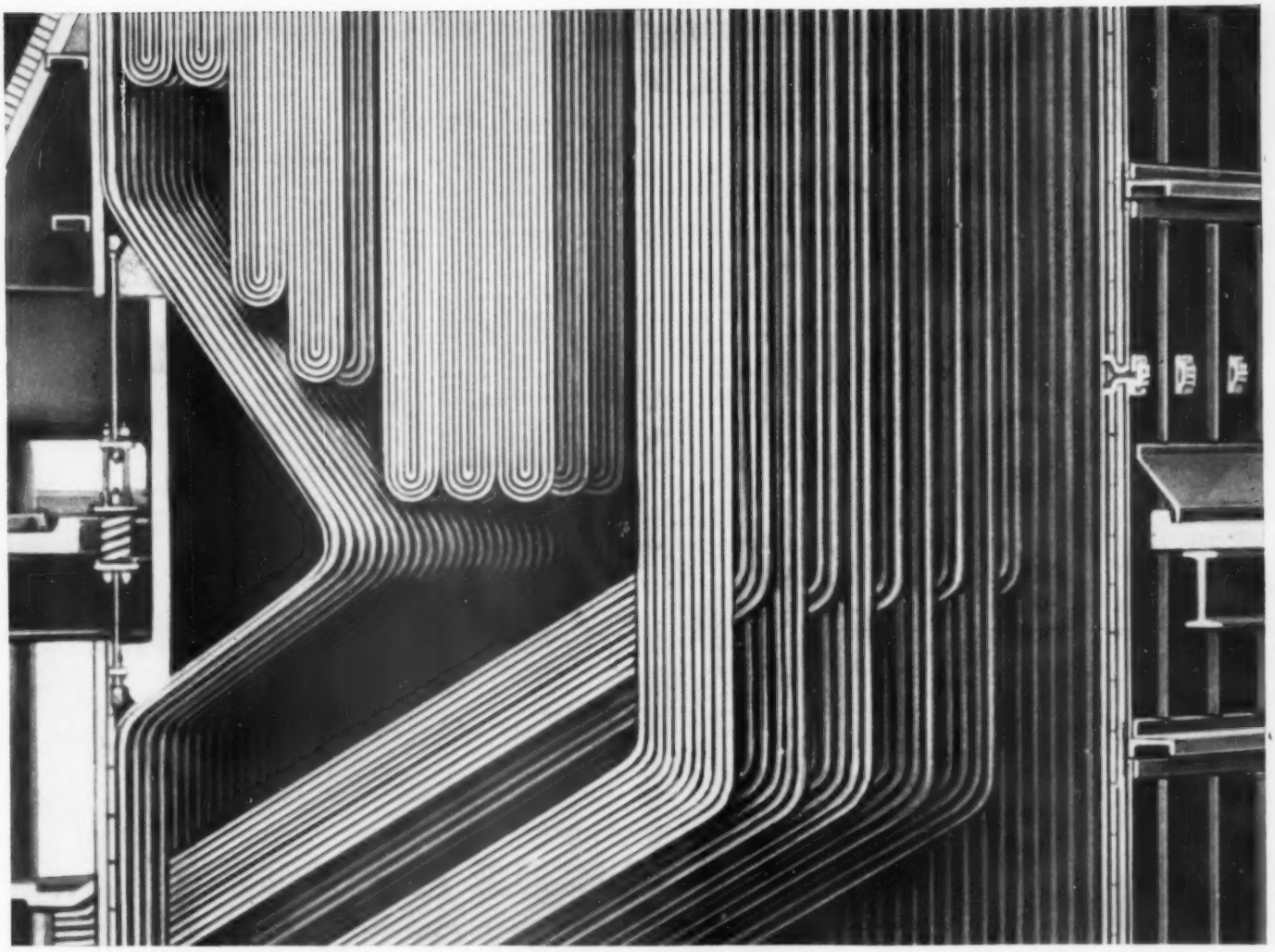
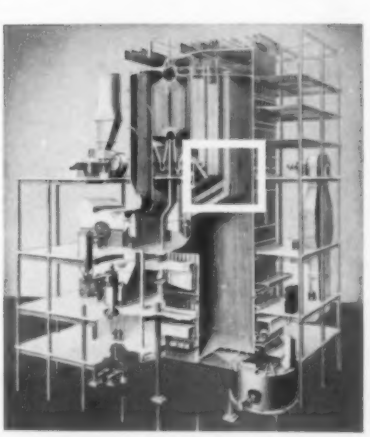


In the new C-E recovery units . . .

Tangent tube "panels" shed slag, add to ease of operation

Each panel in the superheater and furnace screen of the new C-E Recovery Units is a *solid wall* of tubes tangent to each other, with generous spacing between panels. The continuous panel surfaces shed much of the slag as it forms, the remainder being easily dislodged by soot blowers.

This "self-cleaning" C-E design permits smooth, unimpeded gas flow and minimizes slag build-up. Heat absorption is uniform across the width of the furnace. Soot blower effectiveness is increased and surfaces remain cleaner — resulting in important operating economies.



Superheater of the C-E Recovery Unit, as shown here, is located directly over the furnace so that slag falls to the hearth. A section of illustration has been enlarged to show widely-spaced panel construction of superheater and furnace screen.

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ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

Prospects Discussed for New Pulp Mills in British Columbia

The British Columbia government should subsidize a pulp mill in the Cariboo district for a limited period, says John Bene, president of Western Plywood Co., Vancouver.

Addressing the board of trade in Quesnel, center of the Cariboo, Mr. Bene said that a subsidy would offset high pulp manufacturing costs in the interior of the province.

The subsidy would be paid on a gradually decreasing scale for perhaps 10 years. As heavy capital investment in the mill is gradually written off, the subsidy would taper off to nothing. The government would continue to collect increased stumpage revenue from the area for all time, and Quesnel would be the base of a big and stable industry.

Mr. Bene said that for the government to subsidize any one company might be discriminatory, and if the government itself entered the pulp industry, it would compete with private industry.

"This leaves as the least controversial and entirely feasible solution the formation of a cooperative industry joined by the operators of the area," said Mr. Bene. "The lumber and plywood industry around Quesnel will continue to grow moderately, and with more intensive forest management production may be doubled over the next 40 years. With temporary assistance of the provincial government, however, a large cooperatively owned pulp or paper mill could be established."

Western Plywood Co. had plans for building a chemical pulp mill at Quesnel Lake some time ago, but negotiations bogged down when the provincial government disagreed on stumpage and other forest values. Mr. Bene and his associates have carried out an intensive study of the area for forest product development since the early 1940s.

"Establishment of a secure market for chips and cordwood would put the lumber industry in the Cariboo on a sounder basis," he says. "From each 1000 ft. of logs, there would be additional revenue of at least $5. It would be more economical to practice intensive forest management because there would be a market for thinnings and pulp logs."

Some of the factors that make pulp production more costly in the interior of B.C., Mr. Bene says, are colder winters, higher insurance rates, necessity of handling frozen logs in winter, need of drawing pulpwood and chips by road and rail from a wide area and a limited supply of electric power, gas and water. Such adverse factors would justify subsidized pulp mill investment and operation on a cooperative basis.

Minister Urges New Mill

Lands and Forests Minister Ray Williston recently told lumbermen that mills in the Prince George area of B.C. are wasting about 65% of their raw material through lack of adequate processing that would be provided by a pulp mill. He suggested they work out a co-operative system whereby wood now being lost to industry could be made available for pulp manufacture.

"A pulp mill is a necessity in this area," Mr. Williston told the Northern Interior Lumbermen's Association. He referred to the Kamloops Wood Conversion, Ltd., in the southern interior of the province—a setup whereby five sawmills had installed chipping facilities and pooled their shipments of chips to coast pulp mills.

Prince George, being more distant from such a market for chips, would

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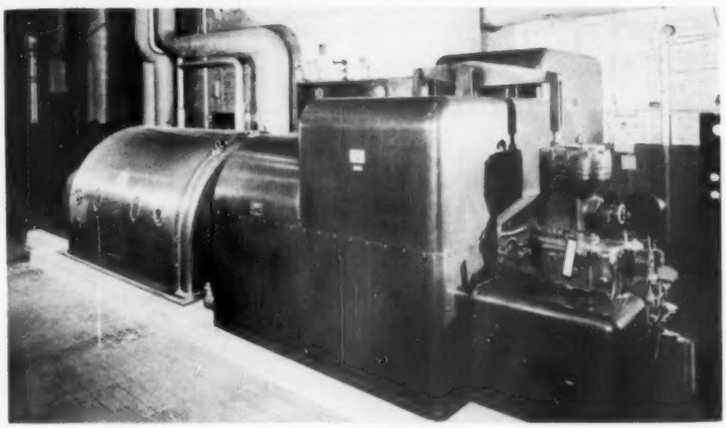
Immediate Delivery

6250 KVA WESTINGHOUSE TURBINE GENERATOR

Non-Condensing 850 PSIG
850° FTT
110/125 PSIG Back Pressure
Voltage 3/60/2400 Volts

Unit in Excellent Condition—
Will furnish complete information and inspection reports—
Investigate while available



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2—3750 KVA Westinghouse 600 PSIG, 750° FTT, 125 PSIG B.P., 2400 V.
1—9375 KVA Allis-Chalmers 850 PSIG, 850° FTT, 110/125 PSIG B.P.

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Proved Best for Neutral Sulphite Corrugating Pulps

The name Pandia appears on more corrugating pulp digesters here and throughout the world than any other name.

That's because Pandia is the recognized leader in the development of equipment for neutral sulphite pulp. Pandia has the experience... supplies standard pulp mill equipment that has proved itself by producing results.

This highly regarded system begins with the Pandia Chemi-Pulper continuous digester and includes blow tank, agitators, pumps, the Breaker Trap, Refiner and Washer... all by Pandia.

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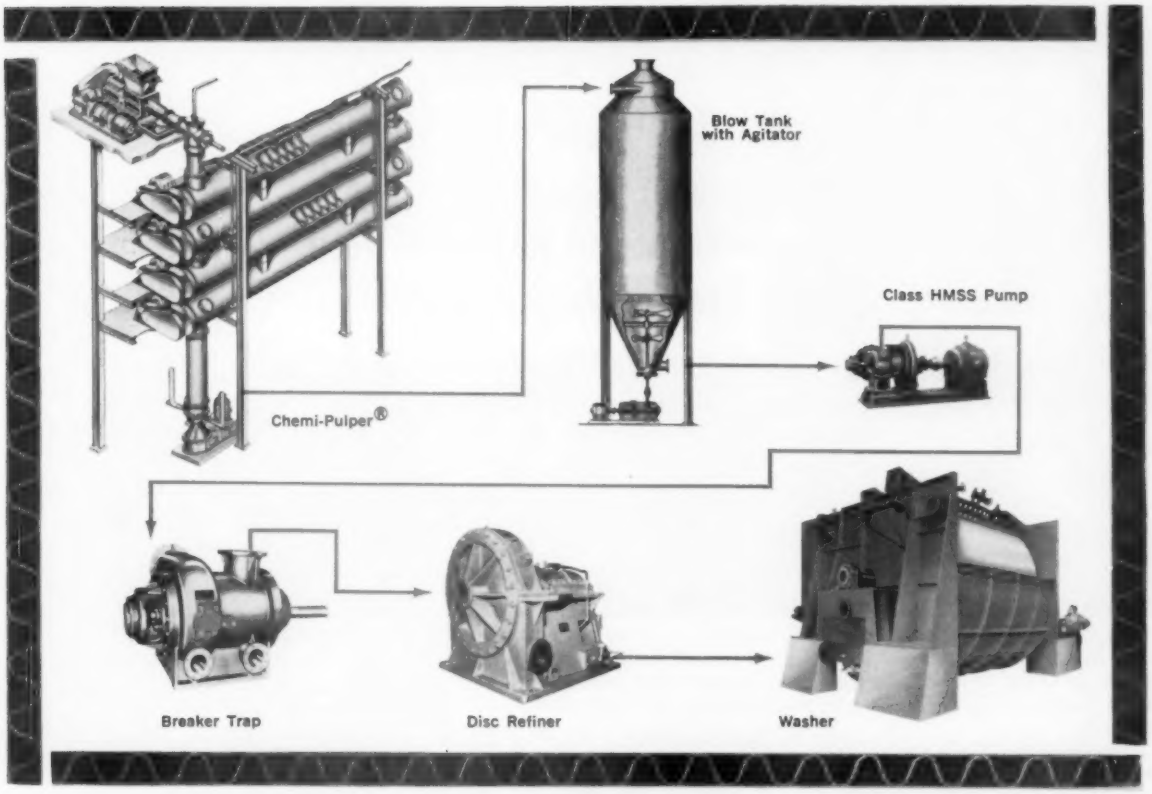
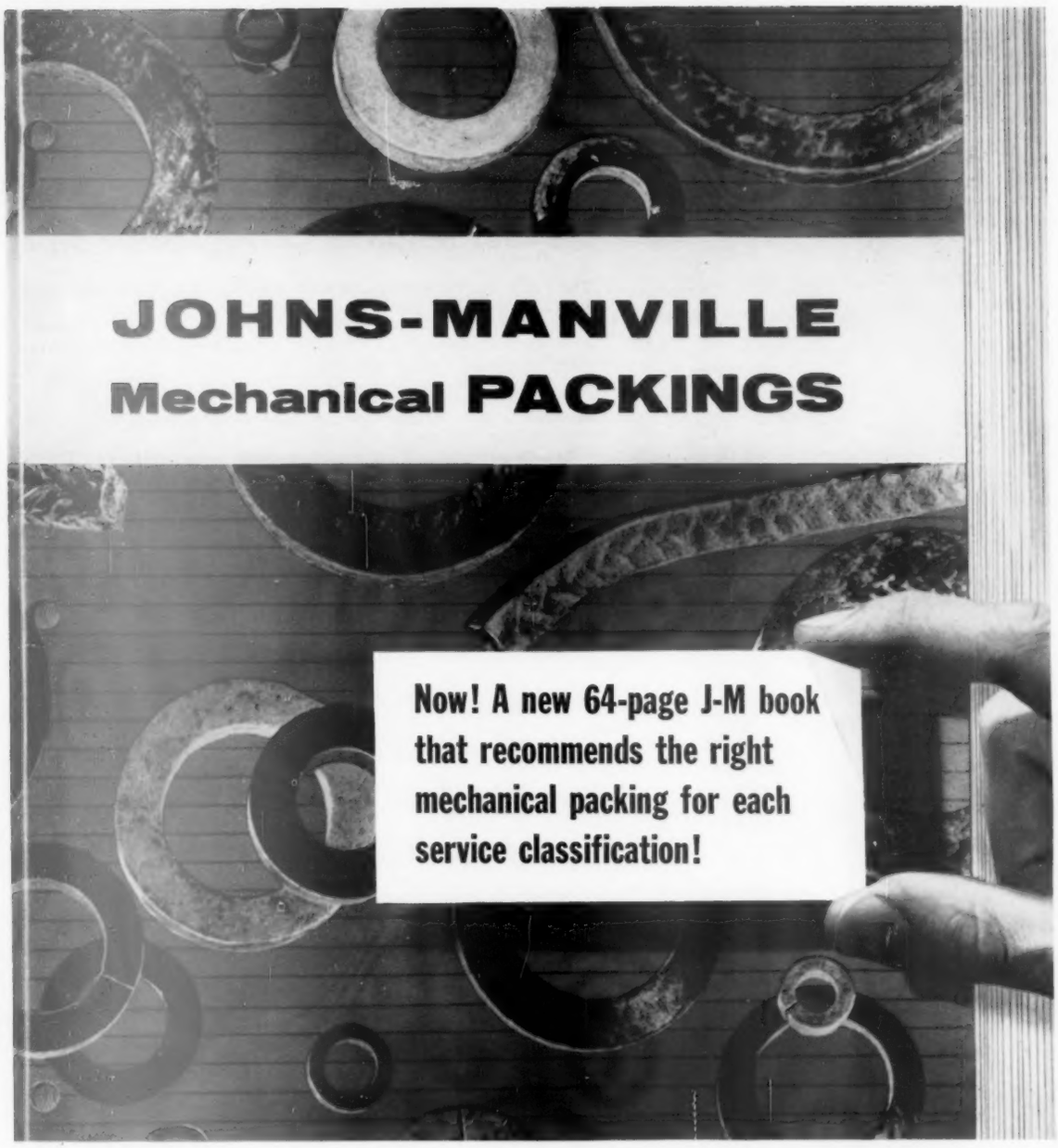
The Black-Clawson Company
Pandia Division, Middletown, Ohio



Co-ordineered Pulp Mill Equipment

BLACK-CLAWSON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Now! A new 64-page J-M book that recommends the right mechanical packing for each service classification!

You'll find a wealth of helpful information on every page of this new Johns-Manville Mechanical Packings book!

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This book places years of J-M research . . . knowledge . . . and skill at your service. Because it recommends the best packing practice for each particular application, it can help you get maximum service from your equipment and your packings.

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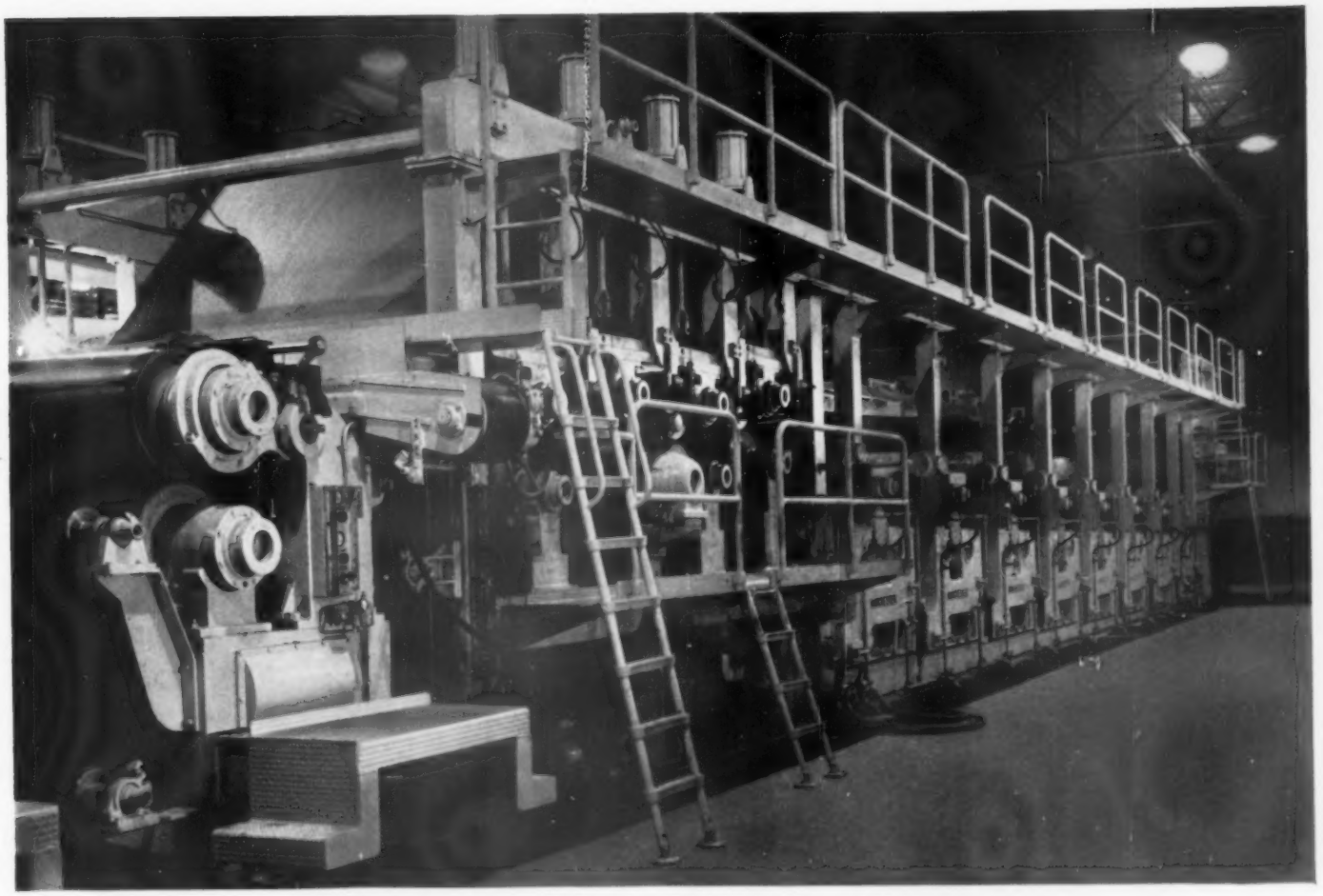
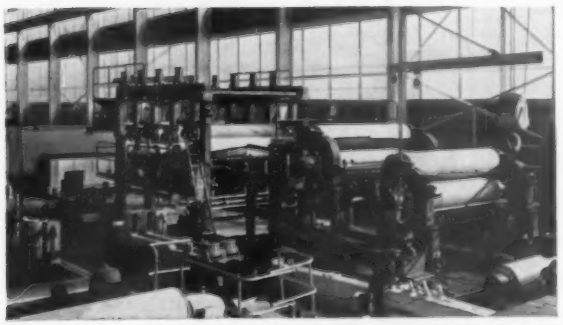


ALL NEW Manchester 8-cylinder wet-end installed at Pryor, Oklahoma mill of Bestwall Gypsum Co. Machine began operation just 23 days after soleplates were set.

Another Manchester machine shows its stuff

Starts-up with 47 straight hours paper production—all saleable



PRIMARY and main press section of Bestwall Gypsum machine erected in Manchester plant. All moving parts were checked out under power before shipment—an extra quality inspection Manchester makes on all machines.

From initial start-up, this modern Manchester machine ran continuously 47 hours *without a wet-end break.* Right from start-up all paper produced was saleable. This new Bestwall Gypsum installation is another typical example of Manchester's smooth, efficient handling of major projects.

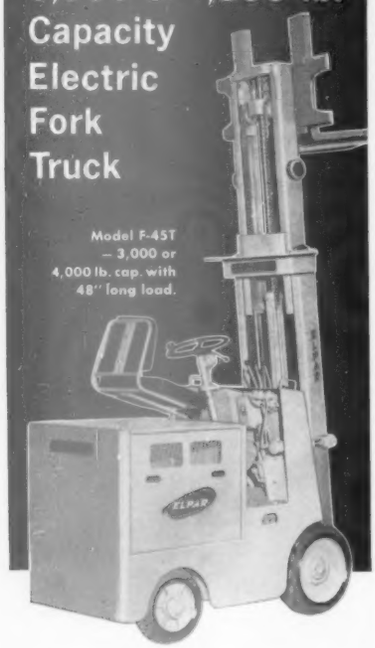
Sound, experienced engineering is one important reason you can expect performance like this with all Manchester machines. Equally important are the extra quality steps Manchester takes throughout manufacturing . . . and after. For example: Manchester completely assembles all machines in its new 100,000 sq. ft. plant before shipment. Matchmarking all assemblies assures perfect fits, eliminates re-machining, saves you costly hours, even days, in installation. You get "on stream" faster . . . as Bestwall Gypsum did.

Planning to modernize or expand your facilities for higher volume, more efficient production? Call in the Man from Manchester. Write: **THE MANCHESTER MACHINE COMPANY, MIDDLETOWN, OHIO**

Manchester . . . profit builders for papermakers

THE MANCHESTER MACHINE COMPANY

ELPAR
3,000 & 4,000 lb. Capacity Electric Fork Truck



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The ELPAR F-45T is priced competitively yet offers the ultimate in quality that's traditional with all ELPAR electric trucks. Check these advantages:

- Fast Travel and Lift
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- Tough and Dependable
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And, it's economical. The F-45T operates on only pennies per day and is designed for fast, easy maintenance.

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ELECTRIC TRUCKS

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4205 St. Clair Avenue • Cleveland 3, Ohio
In Canada: Industrial Equipment Co., Ltd.

not lend itself so effectively to such an arrangement; hence Mr. Williston's advocacy of a pulp mill at that location.

"This matter is hot right now," Mr. Williston informed the lumbermen. "There are groups not only on this continent but in Germany which regard the Prince George area as a suitable pulp mill site, with dual capacity for production of sulfate pulp and newsprint.

"Nowhere on this continent does the sustained yield practice offer so great an opportunity for the pulp mill operator, but investors are hesitant because of the danger of strikes or possible reluctance of loggers to sell to them."

Mr. Williston suggested that an arbitration board, or similar body, might be formed to guarantee operators a fair return and the pulp mill management a fair price and supply.

Need for a pulp mill was emphasized because of the growing lumber production in the interior of B.C. For the first time in history, more lumber was produced in the interior regions than on the coast.

Mr. Williston reminded the Prince George meeting that in recent years many sawmills on the coast would have been in financial difficulty had they not been able to offset their lumber losses through production of chips for the pulp mills.

The minister also warned the operators that they were overcutting; that the cut of nearly 100,000,000 cubic feet represented a 135% increase over the corresponding first quarter in 1959, and was already more than 70% of the total 1959 cut. As a remedy, he urged lumbermen to go farther north into the great spruce stands where there was better opportunity for establishment of large-scale sustained yield areas.

New Machine Now Operating At Longview Fibre

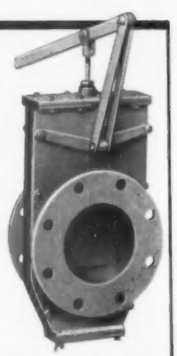
Production of toweling and other lightweight paper grades on the 1,500-fpm Beloit 95-in. machine began recently at Longview Fibre Co. According to W. W. Clarke, vice pres., mill mgr., the new No. 8 unit is rated at 50 tons per day, but plant output will be upped considerably more than that "by relieving larger machines of these lightweight grades". Another Fourdrinier machine—No. 9, rated at 125 tons per day—is on order for start-up during second quarter of 1961. It will raise plant's average daily output to 1,250 tons.

ROCKWELL SLIDE VALVES

for GASES SLURRIES OR FREE-FLOWING SOLIDS THAT CLOG OR JAM OTHER VALVES...

Standard Slide Valve, screwed end type or flanged (shown); when fully open, valve offers no restriction to fluid flow. Bulletin 500R.

"Kwikleen" Slide Valve—Not necessary to remove from line for cleaning. Sediment discharged at bottom. Complete cleanout by attaching steam, water or air line to plug hole in valve body. Bulletin 501R.

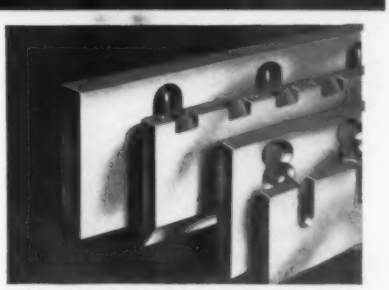


Heavy Duty "Kwikleen" Valve for line pressures to 60 psi. Blade not exposed when in fully open position. Ideal for pulp stock, slurries, dust, fly ash, scale, granular materials. Bulletin 508.

W. S. ROCKWELL CO.
2510 Eliot St., Fairfield, Conn.

Now there's an all-new member of the Simonds family of knives, saws and files—the brand-new Simonds "Si-Namic" paper knife. Here's a knife that incorporates a brand-new steel mix — developed and produced in Simonds own Steel Mill — and a new finish. Combined, they offer you the sharpest, smoothest, longest lasting cutting edge available — and at competitive prices.

Add to this Simonds dependable chipper knives and circular cutters and you can see why, more than ever, your Simonds Industrial Supply Distributor is your number one source of supply for dependable cutting tools.



Simonds T-18 chipper knives are extra tough for giving you more heavy cuts at high speed, for more usable chips and less waste dust.

Whether it's the thinnest tissue or thickest board, Simonds circular cutter, slitters and perforators cut smoothly, easily, truly. There's no better value for your cutter dollar.

Your nearby SIMONDS DISTRIBUTOR is your most dependable cutting tool supply source. His stocks and services are designed with your convenience and economy in mind. Call him FIRST for all your industrial supply needs!

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASSACHUSETTS

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

This 250,000 gallon Watersphere built by CB&I is 41 feet to the bottom.

Foundation space requirements for CB&I Waterspheres are considerably less than for other types of elevated tanks offering comparable capacity. This feature was a prime factor in solving a prominent pulp mill's recent water storage problem.

Large capacity (250,000 gallons) was needed. However, the ground area available for foundation purposes and erection was severely limited. A CB&I Watersphere was the logical choice. It solved the space problem and met every other requirement of the job.

The Watersphere is a product of CB&I's *coordinated services* . . . a single source and responsibility for engineering, fabrication and erection. The result is craftsmanship in steel, skillfully developed over seven decades of experience. Write today for complete information.

The Watersphere and its "big brother", the Waterspheroid are graceful, elevated steel water storage tanks of modern design. An illustrated brochure providing complete design and construction data is available. Write for a copy, today. No obligation, of course.

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332 SOUTH MICHIGAN AVENUE
CHICAGO 4, ILLINOIS

OFFICES AND SUBSIDIARIES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

A cationic urea-formaldehyde resin, Scriptite 40 imparts a high degree of wet strength to paper, with less resin add-on. In addition to raising tensile and wet bursting strength, Scriptite 40 also improves dry tensile strength, dry mullen, wet rub resistance, internal sizing, pick resistance, dry stiffness, dimensional stability, and folding resistance. For technical assistance, samples, and literature, write to Monsanto Chemical Company, Plastics Division, Room 779, Springfield 2, Massachusetts.

Monsanto

MONSANTO DEVELOPER IN **PLASTICS**

The Monsanto line of paper resins also includes: **SCRIPTITE 50** *for unsurpassed printability and improved surface characteristics on boxboard.* **SCRIPTITE 33** *a melamine wet-strength resin.* **SCRIPTITE 52** *in combination with formaldehyde to give water resistance to folding boxboard and to jute liner.* **SCRIPTITE 54** *for outstanding water resistance and both wet and dry rub resistance.*

*SCRIPTITE: Reg. U. S. Pat. Off.

Don't take our word for it—try a new RIDGID Flaring Tool! See if you don't get smoother, stronger, more uniform flares . . . in less time and with less effort than ever before!

Then, compare this new RIDGID Flaring Tool, feature-by-feature, with any flaring tool you've ever seen or owned:

• Feed releases automatically when flare is fully formed. • Reversing feed screw burnishes flare. • Hardened steel die bars are precision-machined. • Large, comfort-grip feed screw handle turns easily. • Precision-ground, hardened steel flaring cone, eccentrically mounted in precision bearings, produces rolling action for even metal flow . . . gives uniform flare walls without galling. • Tubing hole sizes are clearly marked. • Easy sliding rugged malleable yoke serves as stop for tubing to give correct flare size. • Yoke clamp screw fits into centering hole . . . locks bars, yoke and tubing into perfect alignment. • Stop pins keep yoke on die bars at all times . . . yoke can't slide off.

3 Models:	RIDGID No. 457 for 45° flares, ⅛" to ⅝" O.D. (7 sizes) RIDGID No. 459 for 45° flares, ⅛" to ¾" O.D. (9 sizes) RIDGID No. 376 for 37° flares, 3/16" to ⅝" O.D. (6 sizes)

See and try these new RIDGID Flaring Tools. Your Supply House has them.

RIDGID Work-Saver Pipe Tools

RIDGID

The Ridge Tool Company, Elyria, Ohio, U.S.A.

Continuous Digester Research Announced by W. Coast Firms

Fiber Research is a new company recently established by two West Coast firms well known to the paper industry. Aimed at providing laboratory and pilot plant facilities for research and development of continuous digester processes, the project is the joint effort of Washington Iron Works and Hill & Ingman Consulting Engineers.

Under construction is a building to house the laboratory and pilot plant adjacent to the Seattle plant of Washington Iron.

One of the first projects announced by Fiber Research is the development of a successful application of Magnafite pulping to both continuous and batch digesting. Contemplated projects include high-yield cooking for all types of hardwoods and softwoods as well as other pulpable materials.

The new firm is the only independent research organization of its kind in the western states and is one of the first such organizations to be devoted specifically to continuous processes and equipment for pulping, bleaching and washing.

Meet Huyck's

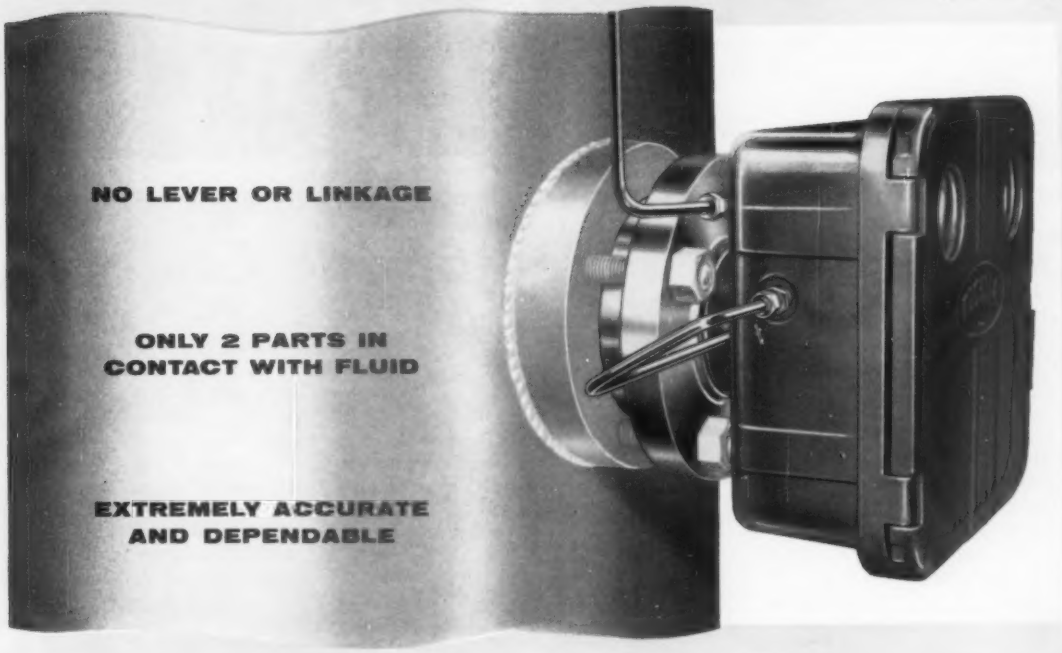
CHURCHVILLE

Joseph J. Churchville is Superintendent of Huyck's Aliceville, Alabama plant — the world's largest modern felt mill. A graduate of Lowell Technological Institute, Joe received a broad manufacturing training at Huyck's Rensselaer, New York plant before his assignment in Aliceville. Drawing upon his sound experience in the manufacture of custom-engineered fabrics and his knowledge of paper mill requirements, he supervises a well-trained production team that assures all customers of top quality, felt after felt.

HUYCK FELTS

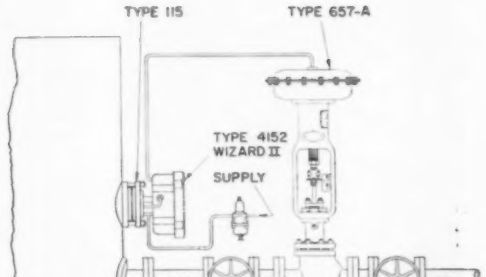
First in Quality • First in Service Since 1870

For that hard-to-handle liquid... consider the "115" Transmitter



Ideal as a liquid level transmitter for slurries, paper stock, and viscous or corrosive fluids

Flange mounts direct to side of tank. Only the diaphragm and the diaphragm ring come in contact with the fluid. Diaphragm is Teflon impregnated glass cloth ... ring can be stainless steel or some other corrosion resistant material of your choice. Pneumatic output of the "115" is a 1 to 1 measure of the liquid head in the vessel. Frequently supplied with the popular Fisher Wizard II as the controller which makes a complete and compact assembly for liquid level control application. Also used as a transmitter for remote, level indicating, recording or controlling. Primarily for open tank service, the "115" is used in pipe lines and vessels with pressures up to 75 psi. For complete information on the Fisher "115" write for Bulletin F-115.



Fisher "115" with the Wizard II as the controller on a liquid level control installation.

IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD . . . CHANCES ARE IT'S CONTROLLED BY

FISHER GOVERNOR COMPANY

Marshalltown, Iowa / Woodstock, Ontario / London, England

CONTINENTAL EQUIPMENT CO. DIVISION, Coraopolis, Pennsylvania

FISHER® Controls

SINCE 1880

TRAVELING TO THE FOUR CORNERS of the world is part of the job for George Hobbs, right, incoming pres. of Bowaters Engineering and Development Co. With him is K.O. Elderkin, whose place he'll take. Fanny Hobbs always feels moments of sadness even when he's leaving for short trips, as at right.

Profile of A Papermaker:

George Hobbs: Man on the Go

● In a typical week, recently, George Hobbs, arrived home from a trip to Montreal, Canada, on Tuesday night, had a business appointment after dinner, spent the next morning in his Calhoun, Tenn., office, was off at noon for Beloit, Wis., and was back Friday morning, planning a trip to New Zealand.

George Hobbs is a man on the go, typical of a new kind of man in industry; the man who must move with the world and the times. In an age when Paris and New York are only six hours apart by air and a trip halfway around the world is all in a day's work, big industry survives on its ability to spread out as the world shrinks and to have people who can spread with it. Such a man is George Hobbs.

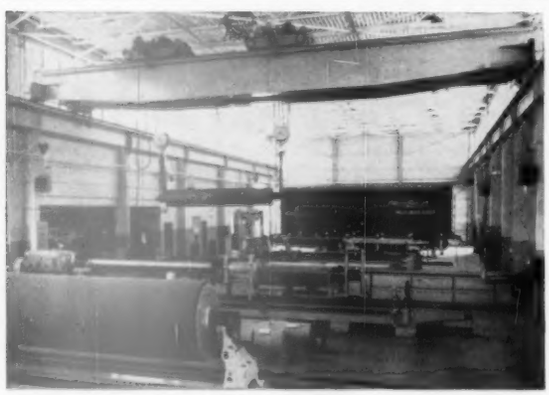
Mr. Hobbs is a native Newfoundlander, born in a town with the intriguing name Heart's Content. The town's other distinction is that it is the terminus for the transatlantic cable. His new home in the heart of the Tennessee Valley might seem a long way from home, but actually the Hobbs' have found the people and the region very much like their former home.

"Pulling up the roots of 14 years can be a difficult thing," he says reminiscently, "but that's the way the world is today. For us it's an adventure . . . and an exciting one."

Mr. Hobbs' career is also exciting. After graduating from McGill University in 1940, he went to work for Defense Industries, Inc., the Crown company which made munitions during the war. In 1944 he joined Marathon Corp., helping to build its first mill on the northern shores of Lake Superior. In 1946 he returned to his first love, Newfoundland, as an electrical engineer for Bowaters' Corner Brook mill. He rose steadily, becoming chief engineer in 1954 and mill manager in 1956. His background in engineering and operations as well as the fact that in 1952 he worked with Karl Elderkin, retiring president of BE&D on plans for the Tennessee mill made him a natural choice for this new assignment.

For Mr. Hobbs this new job means a constantly changing pace, new challenges daily. One day he may be working on the new machine for Bowaters Carolina Corp. at Catawba, S.C., the next on plans for expansion at Tasman Pulp & Paper in New Zealand. Since Engineering and Development handles just that for Bowaters' plants all over the world, it will be, as he puts it, "an adventure."

It is also an adventure for Mrs. Fanny Hobbs, who met George 22 years ago on a St. Lawrence River steamboat. For her it means living in a modern, air-conditioned one-story ranch house jutting out of the Tennessee foothills instead of a two-story frame house which stood ruggedly against winter winds on the bay in Corner Brook. And for the young Hobbs', John, 15, Bobby, 11 and Evelyn, 8, it is also a new experience. Another daughter, Marion, is now attending nursing school in St. Johns, Newfoundland, eight hours away by air.



Simplify Paper Roll Handling Problems with **EUCLID CRANES**

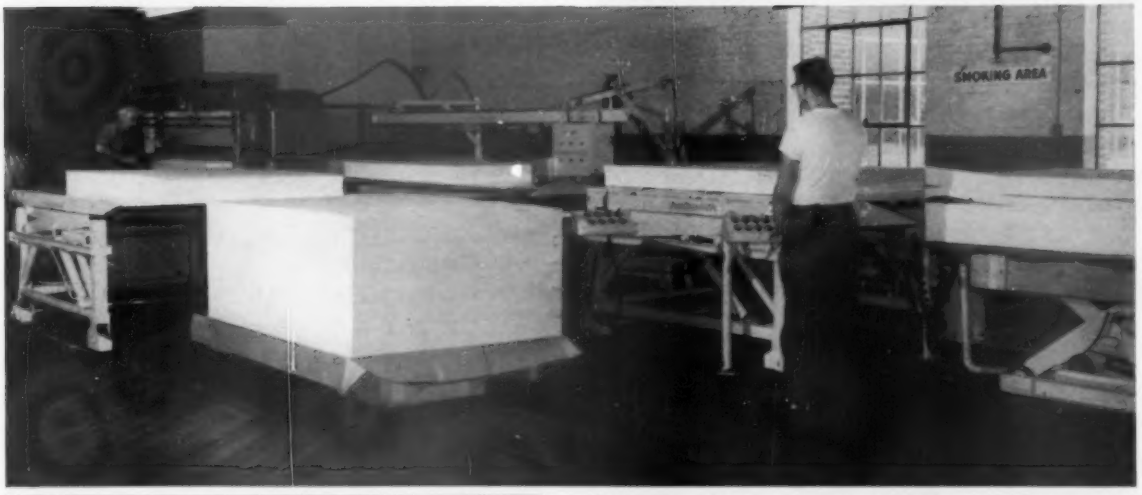
Paper Mill Cranes are a specialty of ours. We've helped build our reputation through close cooperation with production supervisors and engineers in the paper industry.

Shown here is a 30 ton, 5 motor, double box girder Euclid crane in operation at a large southern roll reconditioning plant.

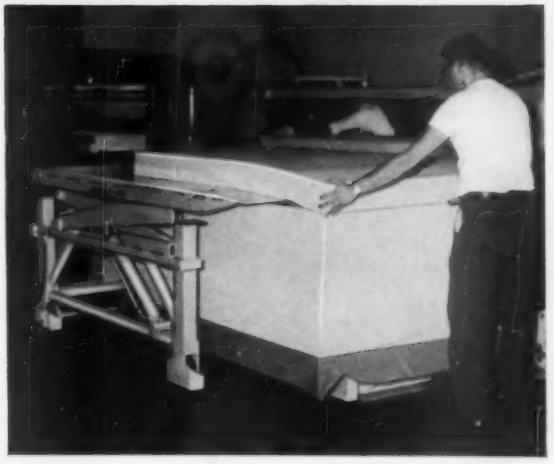
It is floor controlled for convenient operation and incorporates two independently operated trolleys. We'll be glad to discuss your crane or hoist requirements with you.

for details write **THE EUCLID CRANE & HOIST CO**
1363 CHARDON ROAD • CLEVELAND 17, OHIO

HOW SOUTHWORTH STRADDLE TABLES* *doubled* T.P.H. AT MONADNOCK



ON THE RECORD AT MONADNOCK MILLS		
	BEFORE	AFTER
MILL TRIMMERS	3	2
NO. OF SHIFTS	5	4
PRODUCTION	100%	204.57%



T.P.H., or tonnage per hour, determines the efficiency of *any* finishing room. When the production of a trimmer can be increased by 104.57% permitting two trimmers to more than equal the former output of three, as at Monadnock following installation of a Southworth Straddle Table System, it's obvious the Southworth story on cost reduction is something to listen to. This particular chapter includes a note on additional savings because of less damage in handling, as well as a note on improved employee morale due to better working conditions and more productive job assignments.

SOUTHWORTH MACHINE CO. since 1890

*Patents Pending

For Details Write or Call Collect:

SOUTHWORTH MACHINE CO.

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Paper Conditioners; Automatic Carton Sealer; Lift Tables; Air Flotation Tables; Cutters; Deliveries; Layboys; Skid Turners; Hand, Foot, Motor Driven Punching Machines; Humidifiers; Envelope Presses; Punch Heads; Tabbing Knives; Corner Cutters; Custom Built Allied Equipment.

NEW WESTINGHOUSE *Guardistor*

MOTORS LET YOU USE ALL THE HORSEPOWER YOU PAY FOR...SAFELY

The man and the motors from Westinghouse now provide absolute protection against motor failure caused by excessive heat . . .

Our Engineering Manager says:
"With the breakthrough development of the Westinghouse Positive Temperature Coefficient thermistors, for the first time we can provide inherent protection against motor failure caused by excessive heat. The solid-state thermistors buried in the windings instantly sense excessive heat from any cause and simultaneously warn of trouble or automatically take the motor off the line. Thus, motor protection is placed where only true motor protection can be . . . in the windings."

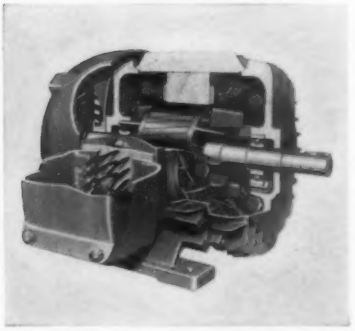
Our Marketing Manager says:

- "You can match the motor to the load . . . use all the motor you are paying for.
- Provides positive protection based on winding temperature . . . *not* load current and/or power supply fluctuations.
- Eliminates time and expense of changing winter-summer heaters. No nuisance tripping, it's fail-safe . . ."

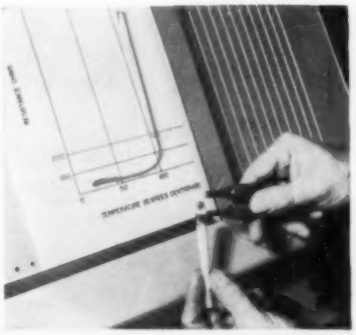
Call your Mr. Westinghouse for the application of a Guardistor* motor to your drive requirements . . . write for *Questions and Answers About . . . Guardistor* (B-7876). Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. You can be sure . . . if it's Westinghouse.

*Trade-Mark

J-22160-R



Unlike remotely located sensing devices, PTC thermistors are buried in the windings of the Guardistor motor, instantly equating all temperature factors.

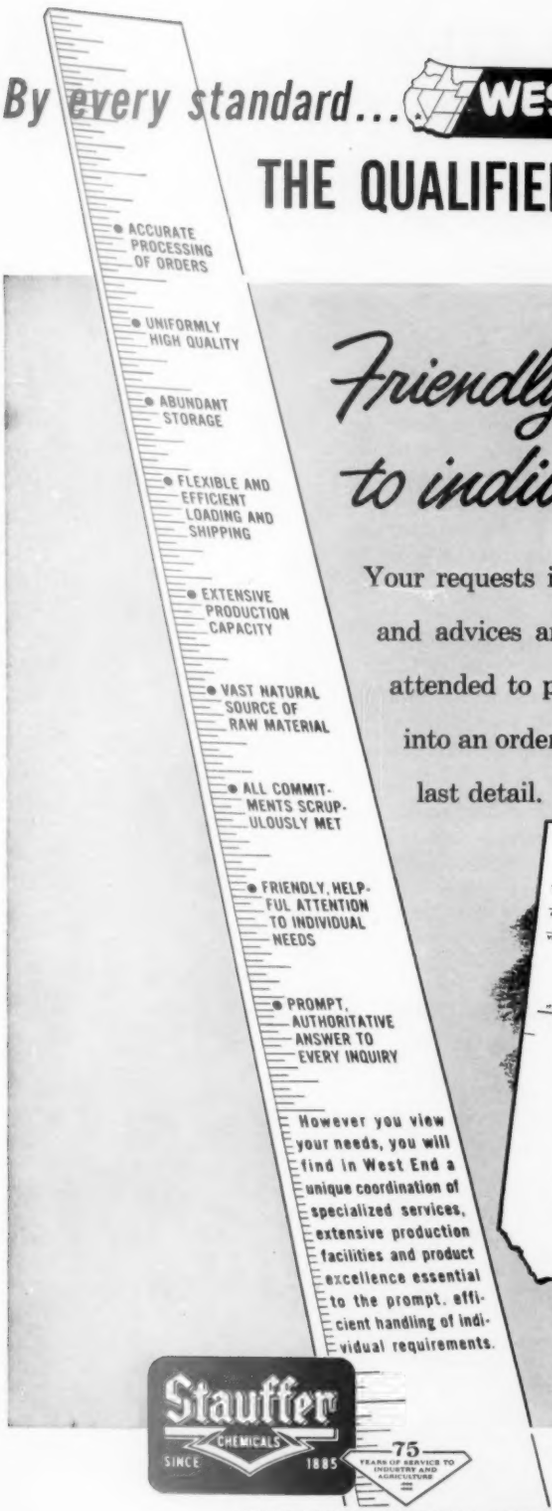


Ever alert PTC thermistors constantly totalize temperature, statically triggering an action *only* if critical temperature is reached.

MOTOR & GEARING DEPARTMENT

Westinghouse

By every standard... WEST END MEASURES UP AS THE QUALIFIED SUPPLIER OF SALT CAKE


ACCURATE PROCESSING OF ORDERS
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ABUNDANT STORAGE
FLEXIBLE AND EFFICIENT LOADING AND SHIPPING
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VAST NATURAL SOURCE OF RAW MATERIAL
ALL COMMITMENTS SCRUPULOUSLY MET
FRIENDLY, HELPFUL ATTENTION TO INDIVIDUAL NEEDS
PROMPT, AUTHORITATIVE ANSWER TO EVERY INQUIRY
However you view your needs, you will find in West End a unique coordination of specialized services, extensive production facilities and product excellence essential to the prompt, efficient handling of individual requirements.

Friendly, helpful attention to individual needs

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Ship in hopper type cars to arrive
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on the long run...

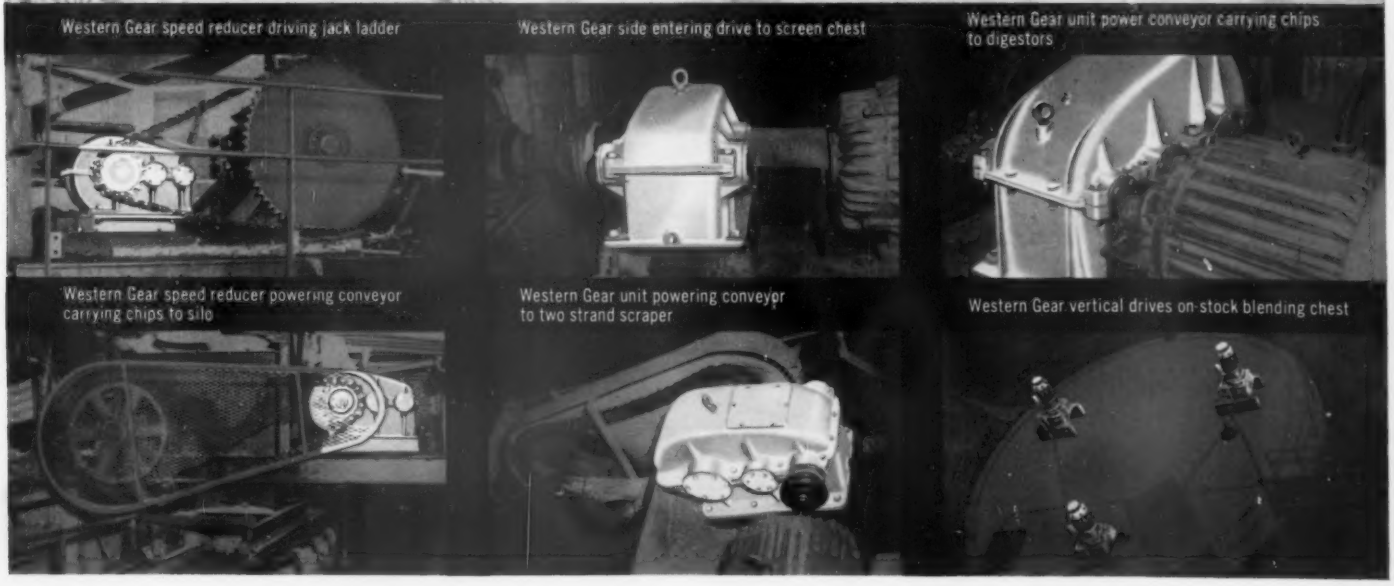
WESTERN GEAR FOREST INDUSTRY PRODUCTS SAVE YOU MONEY BECAUSE

...quality costs you less!

For more than 70 years, Western Gear's name on gear drives has been a standard of quality in forest products industry installations. Western Gear speed reducers and gear drives have become standard equipment in the lumber and pulp and paper mills of the West, and more Western Gear drives are in use in these mills than all other makes combined. ■ Users know why Western Gear forest products industry drives are favored. First, Western Gear's intimate knowledge of the industry enables them to engineer and manufacture to customers' exact needs. Secondly, Western Gear's high standards of quality guarantee rugged, reliable, trouble-free performance. And thirdly, Western Gear's years-ahead engineering anticipates user requirements...and usually gets there first with the answer. ■ Western Gear's experience in electro-mechanics and infinitely variable speed power transmission can solve your drive problems.

For information, write, wire or phone collect to: **WESTERN GEAR CORPORATION** Industrial Products Division, P.O. Box 126, Belmont, California • LYtel 3-7611

WG INDUSTRIAL PRODUCTS DIVISION



Western Gear speed reducer driving jack ladder

Western Gear side entering drive to screen chest

Western Gear unit power conveyor carrying chips to digestors

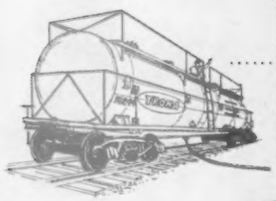
Western Gear speed reducer powering conveyor carrying chips to silo

Western Gear unit powering conveyor to two strand scraper

Western Gear vertical drives on stock blending chest

TRONA®...the largest domestic producer of both sodium chlorate & salt cake for the pulp & paper industry

TRONA . . . Papermakers' grade SALT CAKE
ABERDEEN and **HENDERSON** . . . Highest quality SODIUM CHLORATE



fast, efficient delivery of Sodium Chlorate with Trona's new, modern fleet of tank cars.

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American Potash & Chemical Corporation

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PORTRAITS FOR PERFORMANCE

MEMBERS OF THE MOUNT VERNON FAMILY Of Dryer Felts

One great source of supply gives you the answer to virtually every dryer felt requirement. There's an individual felt for practically every paper machine position and every paper-making need in the Mount Vernon family of dryer felts.

WOODBERRY 403—Synthetically reinforced, full-faced asbestos dryer felt. Designed to yield long life and maximum drying efficiency in the hottest positions.

RICHLAND 343—Synthetic reinforced cotton dryer felt. Engineered to endure longer runs where real wear-resistance is needed.

WOODBERRY 887—Medium weight cotton dryer felt with asbestos yarns in the face. Recommended for a wide variety of drying applications.

SIAMESE 135—All-cotton duplex dryer felt with exceptionally smooth face. An old reliable for positions where maximum porosity and efficient drying are needed.

WOODBERRY 203—Heavy-weight, full-faced asbestos dryer felt. Provides extra strength where heat-resistant clothing is required.

WOODBERRY SUPER 887—Effective combination of asbestos and synthetic fibers gives this dryer felt potential for running in many positions where similar, but more expensive, combinations are currently being used.

This is the Mount Vernon family of dryer felts. Whatever your need, whatever your problem, Mount Vernon engineers will be glad to discuss requirements, and recommend the dryer felt in the Mount Vernon family that is best suited to do the job at hand.

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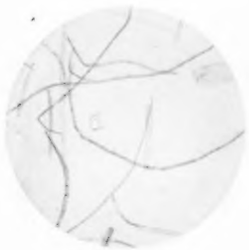
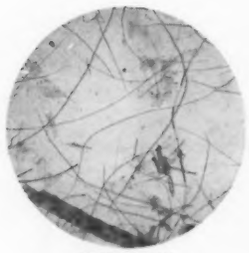


WHEAT STRAW

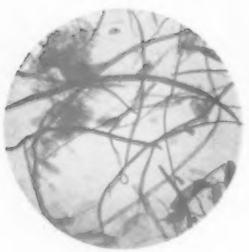


RICE STRAW

REEDS
(phragmites communis)

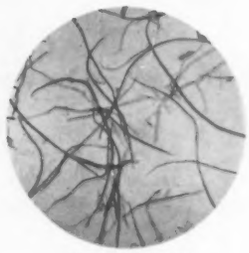
ELEPHANT GRASS
(before cleaning)

We build pulp and paper mills

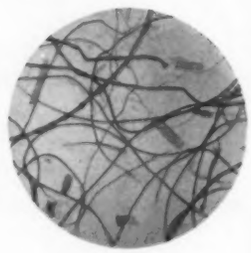


CORN STALK
(before depithing)

SUGAR CANE BAGASSE
(completely depithed)



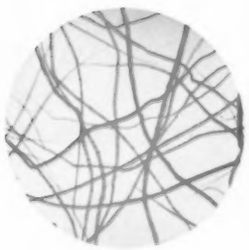
ESPARTO GRASS



BAMBOO

around the world

magnification:
approx. 35x



KENAF

MANILA HEMP

EUCALYPTUS SALIGNA

MONTEREY PINE

using these locally-abundant raw materials

Many countries have improved their economic position by making pulp and paper from locally-abundant grasses, woods and agricultural fibers. They began by having Parsons & Whittemore conduct a thorough technical and economic field survey. The selection of the proper process and equipment for use of such fibers is dependent upon many factors that can only be properly evaluated by highly-experienced personnel.

Field research is only one of Parsons & Whittemore's services. Our organization has world-wide technical, financial and machinery-manufacturing facilities that enable us to plan and supervise the designing, engineering, financing, construction and equipment of pulp and paper mills in any country having the required raw materials. We will even train local workers to operate the mill...and our branch offices will arrange for the sale of the plant's pulp and paper output on world markets. For information on any or all of these services, write to our nearest office.

THE PARSONS & WHITTEMORE / LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

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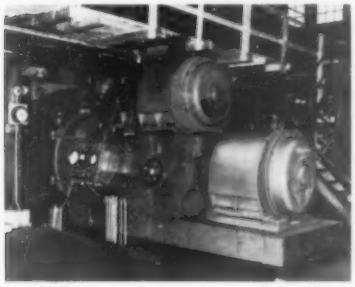
New Equipment Section

Double-Disc Refiner

. . . Superior Performance Claimed



Applications: For stock preparation.
Advantages: Large-capacity unit is said to offer unrestricted stock flow to refining areas, resulting in uniform operating motor loads. Thus, full-connected power is utilized. "Rugged, compact construction" offers savings to industry through less maintenance and lower capital investment.
Specifications: 42-in. unit is capable of 24-hr. service with 1,600 applied horsepower. Feed to discs is by means of a full 12-in. dia. throw screw directly into refining zone. Standard direct-coupled motors are used with the new refiner.
Supplier: **Sprout, Waldron & Co. Inc., 130 Logan St., Muncy, Pa., U.S.A., Tel: LIncoln 6-3111; Leje & Thurne AB, Stockholm 16, Sweden; Reidar Vefling, Piazza Principessa Clotilde 6, Milan, Italy; C. T. Takahashi & Co. Ltd., Room 888, Marunouchi Bldg., Marunouchi, Chiyoda-ku, Tokyo, Japan.**

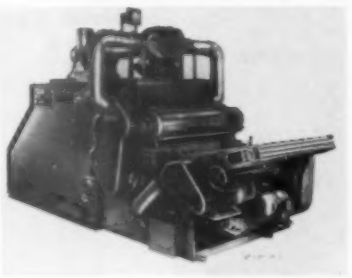
Tube-Flaring Tool

. . . Cartridge-Actuated Device

Applications: For flaring heavy-wall stainless steel tubing, as well as tubing of other materials and lighter wall.
Advantages: Fitting nut and sleeve are slipped in proper position over the tube, tube is placed in the tool against a stop and clamped, the cartridge is inserted and a breechblock screwed on. Light tapping of the firing pin fires the cartridge, producing a double action: (1) pressure provides tremendous increase in clamping force on the tubing, and then (2) firing cone plunges about 1 in., forming and coining the flare. Tube bends may start as close as 2 in. from end to be flared.
Specifications: Forming tubing by explosive action, tool provides the SAE hydraulic 37° flare (J.I.C. standard) as used with Triple-lok and AN tube fittings. Kit includes five sets of flaring dies for tubing of ½-, ⅝-, ¾-, 1- and 1¼-in. outside dia.; assortment of cartridges of varying charges for various tube wall thicknesses and materials, and a selection of hand tools.
Supplier: **Parker-Hannifin Corp. (Parker Fittings & Hose div.), 17325 Euclid Ave., Cleveland 12, Ohio.**

Web-Making Machine

. . . Space Requirement Minimum



Applications: For producing continuous uniform Rando-Web structures from 100% short fiber.
Advantages: Model 40B Special is said to handle fibers such as bleached sulfite pulp, linters, fiberized paper and other materials. Unit lays a continuous web of uniform predetermined thickness and permits continuous production of specialty papers. Among the claimed advantages: simplicity and versatility of operation; low maintenance manpower and overhead, and high production rate.
Specifications: Unit is compact, yet has a hopper capacity of 50 cu. ft. It occupies a minimum of space—168 × 61 × 83 in., weighs 6,250 lbs. and requires 10% hp.
Supplier: **Curlator Corp., East Rochester, N.Y.**

Leakproof Accumulators

. . . in New Complete Line

Applications: For a variety of uses in pulp and paper mills and wherever fluid power is used.
Advantages: The hydraulic piston units contain three "O" rings, all of which are active in the system. An automatic check valve arrangement, described by the manufacturer as "unique," dispenses with pressure build-up between "O" rings. The accumulator is said to be leakproof because of both this basic design and carefully-maintained quality control of close tolerances.
Specifications: Standard operating pressure is 3,000 psi, covering a range from 10 cu. in. to 23 gals.; temperatures −40°F to +200°F.
Supplier: **Hydrodyne Industries Inc. (Louis B. Haberman), 500 Shames Drive, Westbury, L.I., N.Y., Tel: EDgewood 4-8700.**

Pulp Cleaner

. . . for High-Grade Papers

Applications: Design for use on machines producing high-grade papers such as top-quality ledger, bond, offset, etc.
Advantages: No. 609 Centri-Cleaner is said to be highly economical and practical. It is recommended in the secondary and tertiary stages of No. 620 installations where volume is correct. Efficiency falls between the No. 606 and the larger No. 622. Says the manufacturer, the unit—although capacity is just under that of the 622—is competitive in price with the smaller 606.
Specifications: No. 609—9-in. has a capacity of 180 gpm and a 9-in. head dia. Pressure drop across the cleaner is 50 psi.
Supplier: **Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio, U.S.A.; and (for export) U.S. Machinery Co. Inc., 90 Broad St., New York, N.Y., U.S.A., Tel: WHitehall 3-9811.**

Where can faster, more accurate screening make your process more profitable?

In the pulp and paper industry, SWECO Vibro-Energy Separators have become the standard for continuous accurate separation of screenable material. Because of their high capacity, efficiency and range of applications, they are used in 78 major plants in the paper industry for screening clay slips, starch solutions, paper coatings, adhesives and other materials.

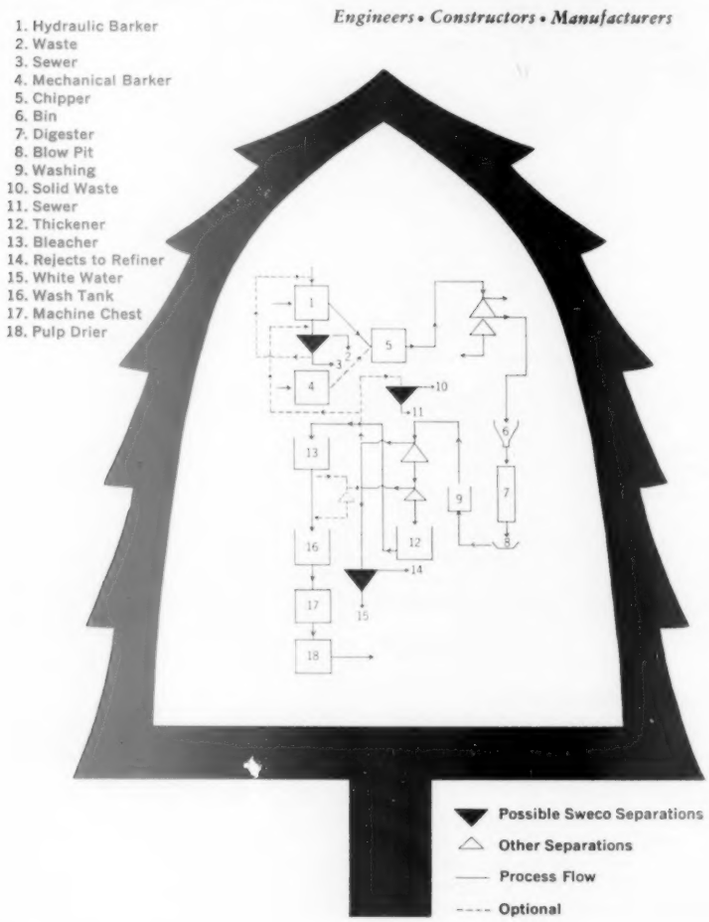
In the manufacture of pulp (sulphite, sulphate, soda and groundwood pulp processes are basically similar insofar as screening operations are concerned), there are at least three operations where SWECO Separators can be used profitably: separation of bark from water, dewatering of rejects, separation of solids from effluent.

A SWECO District Engineer will be glad to go over flow sheets of your process with you, show where SWECO Separators can make more profit for you, and give a demonstration of a SWECO Vibro-Energy Separator in *your* plant with *your* process materials. Write Department 7-19.

SWECO

SOUTHWESTERN ENGINEERING COMPANY, *4800 Santa Fe Ave., Los Angeles 58*

Engineers • Constructors • Manufacturers



17-Ton Log Stacker
. . . Four Design Changes

Applications: To increase mill yard versatility.

Advantages: Series FT increases fork length and demountable tusks, permitting log loads up to 7 ft. in width. Maneuverability in close quarters has been improved by decreasing turning radius from 25 to 20 ft. Access to all functional units is afforded by handholds, ladders and steps.

Specificatons: Load limit: 17 tons. Diesel engine with 210 hp that drives ac and dc generators now replaces 195-hp engine previously used. Counter-weight box especially designed to hold approximately 5,500 lb. wet sand for three-point stabilization.

Supplier: **R. G. LeTourneau Inc., 2399 S. MacArthur, Longview, Texas.**

Check Valves
. . . Increase Application Field

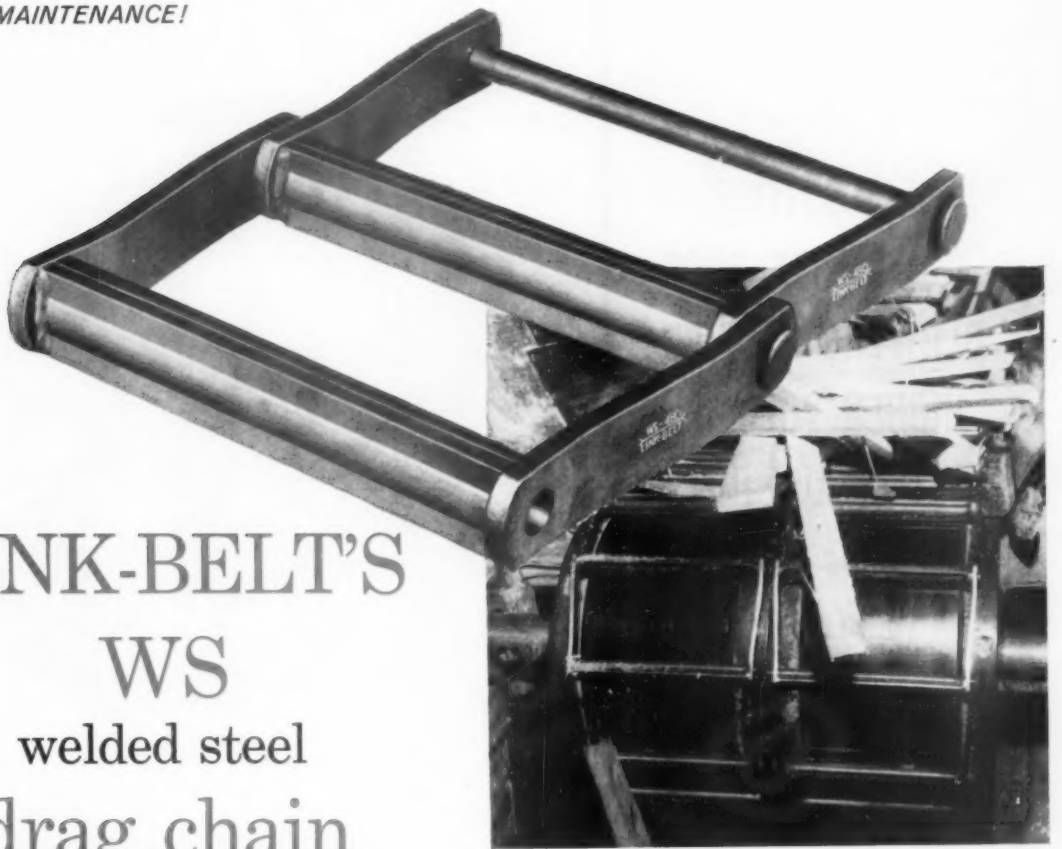
Applications: For handling hydrochloric acid, metal salts, dilute corrosive acids, mixed acids, chlorinated and brominated compounds, and many other active corrodants destructive to most metals and special high-cost alloys.

Advantages: The porcelain valves incorporate a flanged porcelain body, a guided porcelain cone or alumina ball check and a Teflon seat. Units are inert to the action of most chemicals. Solid porcelain body is said to be unaffected by all acids except hydrofluoric and hot concentrated phosphoric and is relatively resistant to alkalis.

Specifications: Recommended for up to 150 psig pressure, assemblies may be modified for spring-loaded operation and are available in sizes from ½ to 3 in.

Supplier: **Lapp Insulator Co. (Process Equipment div.) 121 Hall St., LeRoy, N.Y.**

SPECIFICALLY DESIGNED FOR HIGH IMPACT AND TENSILE LOADS, DURABILITY, AND EASY MAINTENANCE!



LINK-BELT'S WS welded steel drag chain

Link-Belt WS steel drag chain consists of tough, all-steel, welded offset links connected by large-diameter steel pins. The materials, design and construction of these chains provide exceptional resistance to impact loading and wear.

Gives you low operating costs

The favorable strength-weight ratio and unique design of WS drag chain, with welded steel construction and full length bearing area for pins, result in low conveyor operating costs and easy handling during installation, replacement, or repair. Symmetrical design, with identical sliding area top and bottom, permits turning the chain over for added service life. Special attachments can be welded to WS steel chain and reworking in the field is easily accomplished if the links are distorted or damaged in operation.

H combination drag chain

H drag chain

OTHER DEPENDABLE LINK-BELT DRAG CHAINS... H combination drag chains with malleable or Promal (pearlitic malleable) center links connected by heavy steel sidebars with large diameter steel pins, and the H drag chains with malleable or Promal offset links having cast lugs to prevent rotation of the steel pins in the sidebars. All three drag chains operate on the same sprockets.

For complete information on Link-Belt's new WS welded steel drag chain, write for Folder 2772. Or call the Link-Belt office or authorized stock-carrying distributor nearest you. You'll find them listed in the yellow pages of your telephone directory under CHAINS.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,441

NEW SUTORBILT SERIES 3200 BLOWERS DELIVER HIGHER VOLUMES IN HEAVY DUTY SERVICE

The toughest high volume air and gas handling jobs are easily handled by new Series "3200" Sutorbilt lobe-type rotary positive blowers and gas pumps. One-piece shafts, precision machined helical timing gears and the special Sutorbilt timing hub are just some of the features carefully engineered into these new units for continuous, heavy-duty service and low maintenance operation.

Rated from 800 to 20,000 cfm at pressures from 2 to 10 psi, this new line is available with timing gear diameters from 10″ to 22″. Standard equipment includes machined sub-bases, a reversible oil pump with an oversized sump that eliminates an oil cooler at ambient temperatures up to 125 °F and lip-type oil seals (mechanical seals in gas and vacuum pumps) that effectively prevent leakage or gas contamination.

Write today for your free copy of illustrated bulletin giving complete specifications Department G.

Representatives in principal cities. Consult your classified telephone directory.

2192
S25

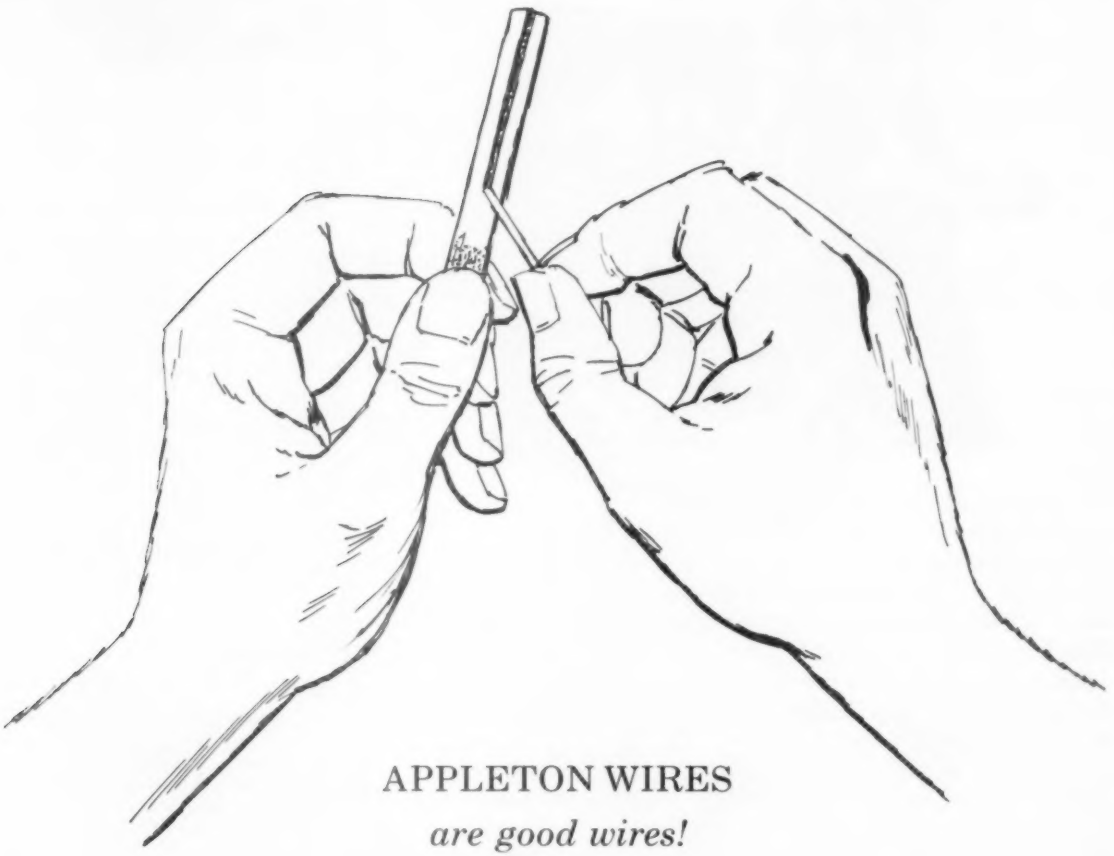
SUTORBILT IS WELL BUILT

CORPORATION, 2966 EAST VICTORIA ST. • COMPTON, CALIF.
SUBSIDIARY OF FULLER COMPANY • CATASAUQUA, PA.

FULLER COMPANY GENERAL AMERICAN TRADE MARK

leading manufacturer of wires for

CIGARETTE PAPERS



APPLETON WIRES
are good wires!

APPLETON WIRE WORKS Corp. PLANTS AT APPLETON, WIS., AND MONTGOMERY, ALA.; INTERNATIONAL WIRE WORKS, MENASHA, WIS. AN AFFILIATED COMPANY

NASH

Paper Mill Vacuum Pumps Designed for Every Desirable Quality, and the First of these is

DEPENDABILITY

When just 3 days lost production on a paper machine can cost more than the vacuum pumps, dependability is the vital factor in pump selection.

Nash Vacuum Pumps are dependable because they are built big enough and heavy enough to stand the pounding of around the clock production, day in and day out. They are reliable because they have only one moving part, and that rotating without wearing metallic contact. They are reliable because the heavy duty ball bearings are located outside the pump casing where they are accessible. They are reliable because they operate at the low speeds necessary for long life and reliable operation.

Nash Vacuum Pumps have been proving their ability to insure uninterrupted production in leading paper mills for nearly a half century. Install them and be safe.

The new Nash 5308-A shown above, has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce a variety of capacities and vacuums.

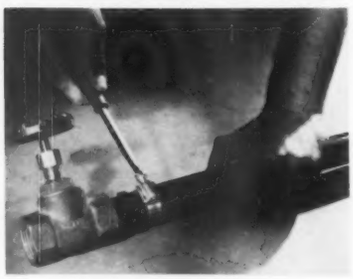
NASH ENGINEERING CO.

South Norwalk, Connecticut, U.S.A.

NEW EQUIPMENT

Plastic Pipe Line

. . . Includes Insert Fittings

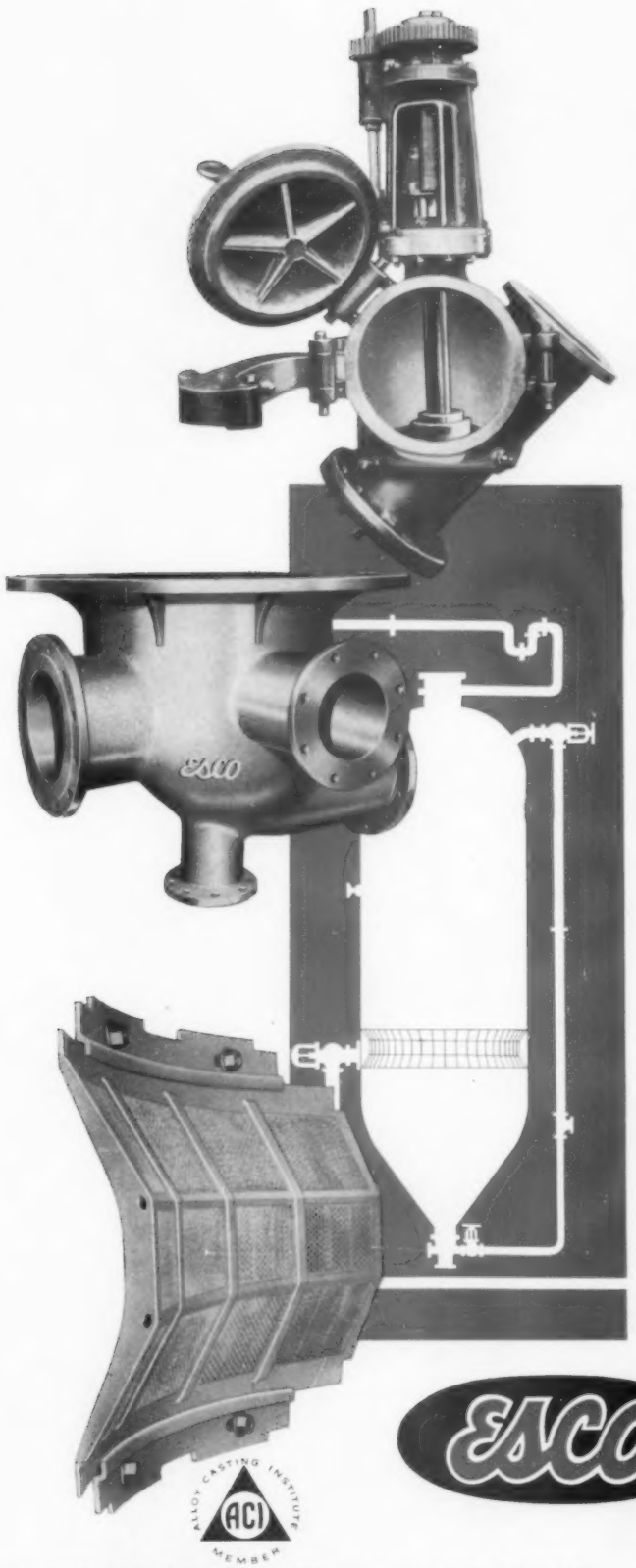


Applications: For piping of corrosive acids, brine and alkaline solutions.
Advantages: Because of smplicity of installation (one man and only three basic tools can do the job), it is claimed that the new flexible pipe and fittings are readily adaptable to a variety of applications. Polypropylene resin fittings assure leak-proof connections and long usage. Because of their durability, according to the manufacturer, they will eventually replace metal, nylon and rubber-blended polystyrene fittings now on the market.
Specifications: Trademarked Poly III, the plastic pipe is available in sizes from ¼ through 2 in. Full line of fittings also available.
Supplier: **Crane Co., 836 So. Michigan Ave., Chicago 5, Ill., Tel. WAbash 2-3123.**

Car-Shaker

. . . 10 Cars per Day—or More

Applications: For unloading chips, granular material, etc., from railroad hopper-bottom gondola cars.
Advantages: The 3½-ton shaker has been streamlined by fitting its self-contained, completely-sealed, two-bearing mechanism into the nodular iron housing within the body. Mechanism is readily accessible by removing one side plate. Shaker body has extra long, wide-faced shoes to fit any standard U.S. hopper-bottom gondola car. It is "designed for fast, safe, economical pushbutton unloading of 10 cars or more per day."
Specifications: The 3½-ton unit includes short-center V-belt drive and 10-hp high starting torque motor. Motor is isolated by four rubber mountings. Lift beams drilled to accommodate single- or twin-hook hoists and include lift chains.
Supplier: **Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis., U.S.A.; and (for export) Allis-**



ESCO CIRCULATING SYSTEMS IMPROVE PULP QUALITY REDUCE OPERATING COSTS

...VERIFIED BY NEARLY 500 ESCO-ENGINEERED INSTALLATIONS

Wherever wood pulp is manufactured, *ESCO* circulating and indirect heating systems are known and used. Whether the cooking process is Kraft, soda, semi-chemical, calcium-base sulphite or soluble-base sulphite, *ESCO* systems improve product quality, increase production and lower operating costs.

Complete systems, tailored to your specific requirements, can be furnished by *ESCO*. *ESCO* has the pulp mill engineering experience and metallurgical know-how to make longer-lasting, more efficient strainers, bottom blow fittings, neck liners, shell insert fittings, valves, and pipe. All components are available in the steel alloys best suited for your operation.

Arrange today to have an ESCO representative call on you. Also ask for your free copy of ESCO's Custom Alloy Steel Castings brochure.

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MFG. PLANTS AT PORTLAND, ORE. & DANVILLE, ILL. • Offices in Most Principal Cities • ESCO INTERNATIONAL, NEW YORK, N.Y. • IN CANADA ESCO LIMITED

PAPER CONDITIONING

THE MODERN EFFICIENT ECONOMICAL WAY

■ VAPO SYSTEMS method of conditioning paper is the time-proven method of properly and uniformly adding the desired moisture content to your sheet. VAPO SYSTEMS units are proven spraying surface materials as Starch, Casein, Wax, Clay, etc. Mills report that Vapo Systems paid for themselves in less than a year. ASK ABOUT IT.

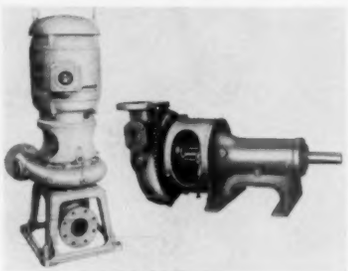
**Photo shows one of several installations in a large mill.*

WRITE FOR FACTUAL DATA ▶ **VAPO SYSTEMS**
136 Home Ave.
Villa Park, Ill.

NEW EQUIPMENT

Chalmers International, 100 Church St., New York, N.Y., U.S.A., Tel: BEekman 3-9100.

Centrifugal Pumps
. . . Matched NEMA Dimensions



Applications: For a variety of liquid-handling modifications.
Advantages: The Adapt-Able pumps are designed to furnish a wider range of clear water, non-clog and other liquid modifications. Sach pump is NEMA-matched—that is, dimensions align with those of NEMA-rated motors for ease of mounting and trouble-free operation. Manufacturer reports that standardization with NEMA motor frame dimensions allows installation without makeshift height-adjusting blocks and odd-bore coupling. maintenance and conversion are made more quickly and easily at site of operation; need for parts inventories is reduced, since even the bearings of pump and motor are interchangeable. Design is said to permit the most economical frame size to be selected to match horsepower requirements of the pumping job.
Specifications: Adapt-Ables are available in both conventionally-mounted horizontal and vertical pump-and-motor units as well as in the F-M Biltogether" construction. Both horizontal and vertical models feature cartridge-type mechanical seals or conventional stuffing boxes. Vertical pumps are constructed so that stuffing boxes can be repacked, bearings adjusted or rotating elements removed without disturbing inlet and outlet pipes.
Supplier: **Fairbanks, Morse & Co., Pump & Hydraulic div. (Brad Tyrrell, sales promotion mgr.), 3601 Kansas Ave., Kansas City, Kans.**

Speaking of Pulpwood

Did you know there is an Owen Grapple especially designed for the pulp and paper manufacturing field? The independent tine action . . . an exclusive Owen patent . . . affords greater grabs and larger log loads.

Write today and get convincing facts and special illustrated pulpwood bulletin . . . free upon request.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO

Southern Corporation, Charleston, S.C.

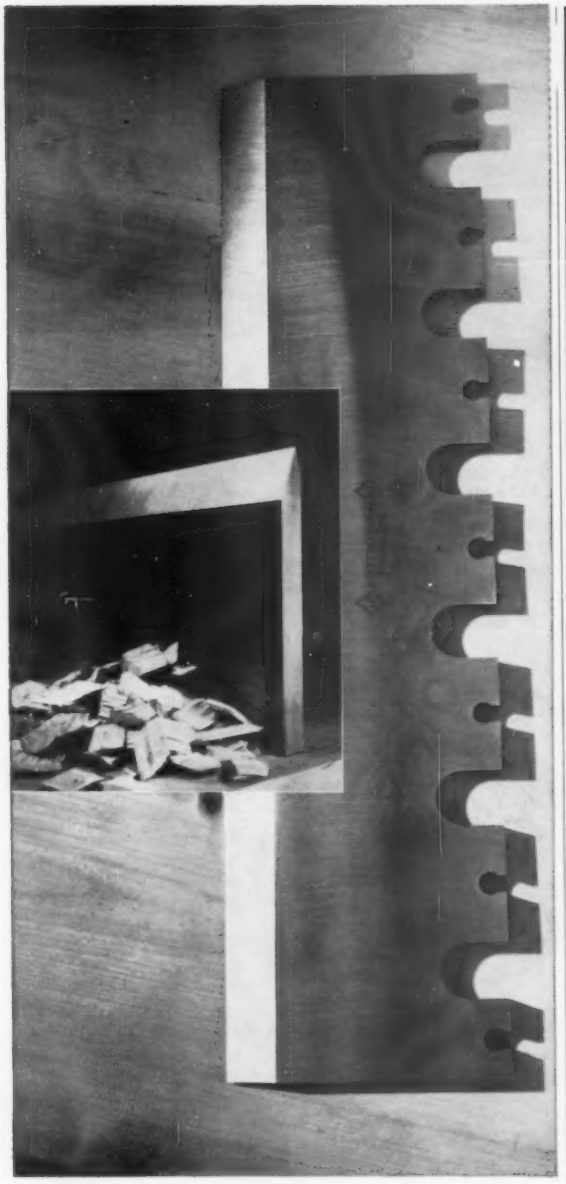
WILLIAMS-GRAY COMPANY
221 North LaSalle Street
Chicago 1, Illinois

WILLIAMS-GRAY COMPANY — Serving the Paper Industry — 1906

PAUL FOSTER
PETER TALBOT
HERB FISHBURN
WES GALLUP
BILL FRENCH

Lindsay Wires
Knox Woolen Felts
Mount Vernon Dryer Felts

Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes



QUALITY KNIVES FROM
HEPPENSTALL

HEPPENSTALL COMPANY
PITTSBURGH 1, PENNSYLVANIA
PLANTS: Pittsburgh, Pa.
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Die Blocks • Forgings • Back-Up Roll Sleeves • Rings
Industrial Knives • Materials Handling Equipment
Pressure Vessels • Hardened and Ground Steel Rolls
Vacuum and Consumable Electrode Melted steels

Celgar Kraft will contain long, thick-walled fibres

1. High Tearing Resistance

Celgar Kraft will contain long, strong fibres such as these from Interior-grown western hemlock. They will give the final paper product the high tearing resistance which is the outstanding characteristic of Western Canadian kraft pulps.

Celgar Kraft

V5763-1

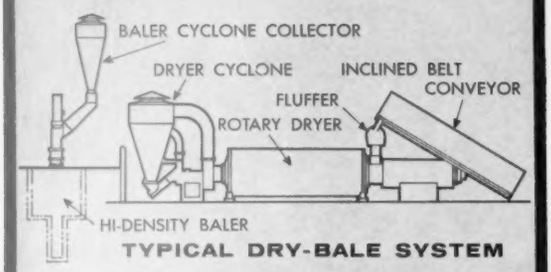
HANCHETT CIRCULAR KNIFE GRINDER
For TOP and BOTTOM SLITTER KNIVES
SCORING KNIVES and SEGMENTS
SEMI and FULL Automatic

GUARANTEE:
1. Concentric with Bore and Running Truth .0005
2. Micro Inch Finishes
3. Grinds Single, Double and Compound Bevels
4. Positive — Accurate Fixturing
5. Longer Mill Life (Less Changes)

MODEL SK-24 WET GRIND

TEST GRIND
We are prepared to grind knives for your inspection and Mill Test.

HANCHETT MANUFACTURING CO.
Main Office
BIG RAPIDS, MICHIGAN
West Coast
PORTLAND 1, OREGON



TYPICAL DRY-BALE SYSTEM

Halifax Power & Pulp Ltd.

dries groundwood pulp to 90% air-dry

Halifax Power & Pulp Ltd., using the Dry-Bale system, is now drying groundwood pulp at Sheet Harbor, Nova Scotia. The new system reduces shipping costs . . . saves storage space . . . permits pulp to be shipped to distant markets. The pulp is readily dispersible, requires less handling, and can be stored in warm climates.

An integral part of the new system is the Heil dryer. A stream of hot air carries the fluffed pulp through the dryer . . . fine fibers are quickly dried and carried away, while wetter, heavier fibers move more slowly for longer exposure to the drying medium. Result: uniform drying of all fibers.

Compound showering flights on each of the three drums eliminate surging and provide maximum utilization of the drying medium.

For descriptive literature on the new Dry-Bale system and the Heil dryer, write The Heil Co. or Bauer Bros. Co., Dept. H, Springfield, Ohio.

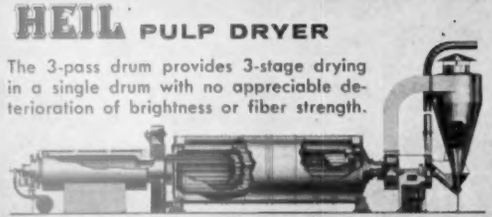
THE HEIL CO.

(Manufacturers of the Arnold Dryer)

3000 W. Montana St., Milwaukee 1, Wisconsin

HEIL PULP DRYER

The 3-pass drum provides 3-stage drying in a single drum with no appreciable deterioration of brightness or fiber strength.



News of the Suppliers . . .

Thomas A. Bruce to West for Corn Products

Formerly representing the Industrial Sales div. in New York, N.Y., he was recently transferred to San Francisco as asst. western regional mgr. for the Industrial div., Corn Products Sales Co. Several of his "more than 40 years" with the company were devoted to West Coast service.

Patrick W. Zilliacus at Western Precipitation

He becomes gen. sales mgr. of the Western Precipitation div. of Joy Mfg. Co., Los Angeles, and in that capacity directs all sales operations of this producer of air pollution control equipment. Mr. Zilliacus is a native of Finland and came to this country in 1940. He was formerly mgr. of agency sales.

Edward P. Vaughan Sr. V.P. at Bulkley Dunton

His promotion to senior vice president was announced by **E. J. Rose**, president. Mr. Vaughan has been a vice pres. since 1955 and was formerly with the Southern Kraft div. of International Paper Co. He joined Bulkley Dunton in New York in 1945.

Officials of **John W. Bolton & Sons Inc.** and of the **Emerson Mfg. Co. div.**, Lawrence, Mass., have completed arrangements with **Aktiebolaget Defibrator**, Stockholm, which make the U.S. firm exclusive sales representative in this country and Canada for the Swedish-built Raffinator disc refiner. Unit is noted for its capacity for performing all types of defibrating and pump-through or pressure refining at high consistency. . . . **Holyoke Machine Co.**, Holyoke, Mass., has completed an addition to plant facilities. This—the third expansion in eight years—doubles storage and warehousing space, while stepping up the finishing operations area some 20%. . . .

Alloy Steel Products Co. appoints **Pacific Pipe Co.**, San Francisco, as distributor for the northern California area. . . . **Olin Mathieson Chemical Corp.** is constructing a $13,000,000 chlorine and caustic soda plant at Charleston, Tenn., with a daily capacity of 180 tons. . . . **Monarch Forge & Machine Works**, celebrating 50 years of service to the forest products industry, is expanding its engineering dept. at Portland, Ore. Says E.N. Rickert Jr., vice pres.: "We anticipate strong growth in the pulp-paper field, and our plans include furnishing of all types of machinery for this industry." . . .

Middle South is being considered for big plastics chemical operation to be built by a new company (Monochem Inc.) formed jointly by **U.S. Rubber Co.** and **Borden Co.** The $50,000,000 facility will be a complex of petrochemical plants and will convert natural gas hydrocarbons into chemicals for plastics. Company is seeking a site on the Mississippi River.

Mater Machine Works Inc., Corvallis, Ore. manufacturer of packaged and automated sawmills, has become a division of **Appleton Machine Co.**, 77-year-old producer of pulp and paper mill machinery at Appleton, Wis. No price was disclosed. . . .

MEETING DATES CALENDAR

September 30-October 1

Pennsylvania-New Jersey-Delaware PIMA (Fall Meeting)
Pocono Manor Hotel, Pocono Manor, Pa.

October 4-6

Fifth TAPPI Deinking Conference
Hotel Conway, Appleton, Wis.

October 6-7

National Assn. of Corrosion Engineers (Western Region Conference)
Sheraton-Palace Hotel, San Francisco, Cal.

October 6-8

National Assn. of Corrosion Engineers (Western Region Conference)
Dinkler-Plaza Hotel, Atlanta, Ga.

October 7

Paper Mill Men's Club of Southern California (25th annual Hi-Jinks)
Fox Hill Country Club, Los Angeles

October 7-8

Connecticut Valley PIMA-New England TAPPI (Joint Fall Meeting)
The Shine Inn, Chicopee, Mass.

October 10-13

10th Corrugated Containers Conference
Royal York Hotel, Toronto, Ont.

October 11

Metropolitan District, Empire State Section TAPPI (Jon Schuber on Bleaching)
465 Lexington Avenue, N.Y., N.Y.

October 11-14

National Assn. of Corrosion Engineers (Northeast Region Conference)
Prichard Hotel, Huntington, W. Va.

October 12-14

Southern and Southeastern PIMA (Joint Fall Meeting)
Williamsburg Inn & Lodge, Williamsburg, Va.

October 13

Ohio Section TAPPI (continuous Pulping, Stock Preparation, Wastepaper Utilization)
Manchester Hotel, Middletown, Ohio

October 14-15

Michigan PIMA
Dearborn Inn, Dearborn, Mich.

October 17-19

15th TAPPI Plastics-Paper Conference
Hotel Syracuse, Syracuse, N.Y.

48th National Safety Congress
Chicago, Ill.

October 19-20

National Assn. of Corrosion Engineers (North Central Region Conference)
Pfister Hotel, Milwaukee, Wis.

October 23-27

15th TAPPI Engineering Conference
Robert Meyer Hotel, Jacksonville, Fla.

October 31-November 2

Packaging Institute (22nd Annual National Packaging Forum)
Statler-Hilton Hotel, New York, N.Y.

Celgar Kraft
also will contain
thinner-walled fibres

2. High Bursting Resistance

Celgar Kraft also will contain thinner-walled fibres from such species as spruce, balsam and cedar. These impart to the final paper product the high bursting resistance which is the outstanding characteristic of Eastern Canadian and Scandinavian bleached kraft softwood pulps.

Celgar Kraft

V5763-2

BOARD MILL SCREENS

The design of Fitchburg NEW TYPE-DUPLEX SLOT Screen Plates is perfect for Board Mill Screens.

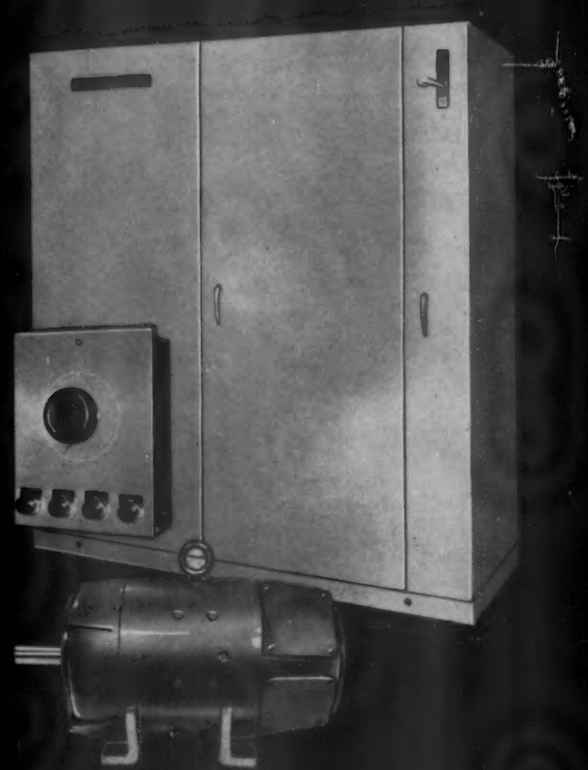
Easy screening, "open" slots, highest capacity and almost complete absence of damage, due to rigidity of our "DUPLEX SLOTS."

Plates stay cleaner — Less "strings" and slime — Less wash-ups.

FITCHBURG
Screen Plate Co., Inc.
301 South St., Fitchburg, Mass.

static-powered or motor-generator

Static-Powered model utilizes magnetic amplifier principle to replace conventional motor-generator set. There are no moving parts to weaken from wear. New forced-filtered air ventilation system reduces floor space required . . . simplifies installation.



Motor-Generator model, newly redesigned, features new cabinet, silicone-insulated d-c motor, new electronic regulators which simplify maintenance and positive-pressure ventilation for longer, trouble-free operating life.

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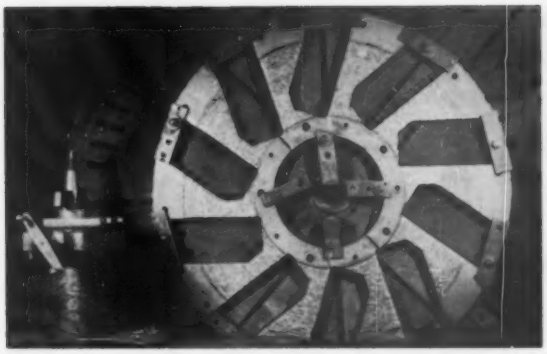

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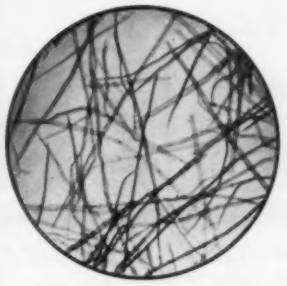

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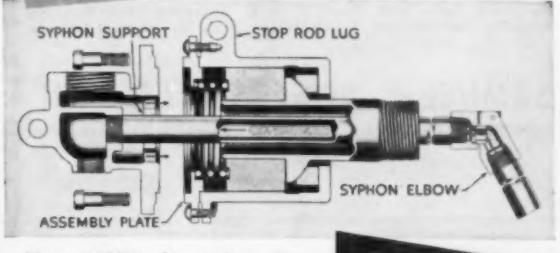

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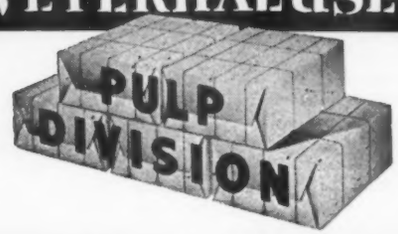

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The Last Word PULP & PAPER Editors' Page

Lesson of Buckeye: Research

Solving the riddle of digester corrosion is only part of the Foley story reported in this issue.

Research looms large. Procter & Gamble carefully planned its Buckeye installation months before construction actually began. Corrosion was under constant study in vast modern laboratories. Materials to be used at the Florida mill were scrutinized, then specified. P&G looked before it leaped.

Certainly, not every pulp and paper manufacturer has the funds to sponsor such extensive and expensive research. The laboratories of the Cincinnati-based company work on a variety of problems for a variety of divisions in diversified fields. Diversification and size contribute much to the final determination of moneys available to research.

But, the lesson of Buckeye is still there—that research, no matter how confined or relatively inexpensive, *prior* to going on stream can prevent headaches and costly downtime days, weeks, months and even years later.

Aurora

To those who have spent sleepless nights,
May I commend the dawn; bright patches
Viewed through silhouetted leaves,
And mirrored in a river 'neath the hill.
At first a palid Eastern zone
Edging into the blue-black of the sky;
Then flaming orange, fast veering into yellow,
Then chartreuse, soon changing to cerulean blue,
The backdrop for a plume of smoke
Arising from the unseen mill.

° ° ° °

The dawn brings solace and courage is renewed.
With gentle Wordsworth, whose heart leapt up
When rainbows he beheld,
My life is strengthened,
And my hopes are reinforced
Whene'er I view the dawn.

SAPIENS.

"Many friends will know that Sapiens is none other than Dr. Louis E. Wise, TAPPI Gold Medal winner and senior research associate at the Institute of Paper Chemistry, Appleton, Wisconsin. We are always pleased to present his poetic productions as we know many readers enjoy them too."

For Freer U.S.-Canada Trade

The question of a more flexible trade relationship between the United States and Canada is receiving increasing attention from economists and business leaders on both sides of the border.

The recent advocacy of a "Selective Free Trade" policy by Dr. Hugh Keenleyside, economics adviser to the British Columbia Government, aroused considerable interest. Dr. Keenleyside suggested that a free trade system could be worked out for commodities made by U.S. companies willing to allocate an appropriate portion of their total production to factories established in Canada. The automobile industry is one example.

Undoubtedly the unique and understanding relationship between Canadians and Americans, coupled with the many advantages of freer trade policies, as demonstrated by both newsprint and agricultural machinery, provide a sound basis for the proposal.

Between them, the two nations possess a vast storehouse of raw materials and extensive manufacturing facilities, many of them not being used to capacity. Already about 65 per cent of Canada's trade is done with the United States.

No one can suggest that there are not obstacles to be overcome between the desire for freer trade and its accomplishment. Nationalism, minority interests and many other problems enter the picture.

But to Americans and Canadians, with their long record of harmonious association in so many fields of endeavor, these obstacles can be overcome and the way cleared for the intensive and sympathetic study that this whole question urgently demands.—*An editorial in the Digester, company publication of MacMillan, Bloedel and Powell River Ltd.*

Sagged When It Should Have Soared

The Soaring Sixties never quite made it—so far. Standing on the threshold of the new decade in late 1959, it was easy for some to be over-optimistic about the Sixties. But now these same forecasters are talking about the Sagging Sixties, basing their judgements on a whole decade upon its first six months performance.

As we stated in "The Challenge of the Sixties," PULP & PAPER, Jan., 1960, a golden age is not born over night. The Fabulous Fifties had its ups and downs. The Soaring Sixties may have sagged on its take-off, but it still has nine years and a few months to go.

There are some leaders in the paper industry who believe that the industry will profit in the long run from the disappointing performance of the first six months. Disappointing, because although production has been record-breaking, it has been below the expectations of the industry. This has had a sobering effect upon an industry that was poised for another expansion wave.

Although the paper and paperboard industry has been operating at about the 90% level of capacity for 1960, some segments are having a bad time and in some grades there have been price reductions. Market pulp, too, may be in for some anxious moments as upwards of 650 tons of daily capacity are brought on stream soon.

There is also some talk about bringing in pulp from the Japanese-owned Sitka pulp mill in Alaska. Although Alaska is one of the United States, some U.S. producers resent the "intrusion" of this pulp, which at one time they had understood would not be sold in the U.S. but was strictly for Japanese consumption. The sale of this pulp, they say, may disrupt the market.

As we said before, the Sixties still have nine years and some months to go.

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Swenson keeps an eye on every Swenson Evaporator, Crystallizer, Dryer, Pulp Washer and Filter built, installed, and operating. Swenson follows through because they don't believe in "silent sentinels"—equipment that sits and works all by its lonesome. Not on your life. They feel that equipment—like engineering—needs backing.

That's part of the Swenson way of doing business—service with a purpose . . . expert *lifetime* engineering service that assures you of controlled processing and production. It starts with preliminary planning . . . follows up with operational recommendations based on experience . . . and continues with post-installation checks that keep your equipment in prime working order.

IMPORTANT BOOKLET! Ask, or write, for "An Open Door"—a 12-page booklet that explains the Swenson Approach toward solving your processing problems. *Swenson Evaporator Company, 15632 Lathrop Avenue, Harvey, Illinois. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.*

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